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REPORT TO U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 9
TOXICS AND WASTE MANAGEMENT DIVISION

REVIEW OF PROPOSED RESPONSE TO EPA ENFORCEMENT ORDER NO. 83-01.

ISSUED TO
MONTROSE CHEMICAL CORPORATION
TORRANCE, CALIFORNIA

November 1983

Prepared by
METCALF & EDDY, INC.
50 Staniford Street
Boston, Massachusetts 02114

Metcalf & Eddy | Engineers Palo Alto, California

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GCA Subcontract No. 1-625-999-222-002

CONTENTS

REVIEW OF PROPOSED RESPONSE TO EPA ENFORCEMENT ORDER NO. 83-01

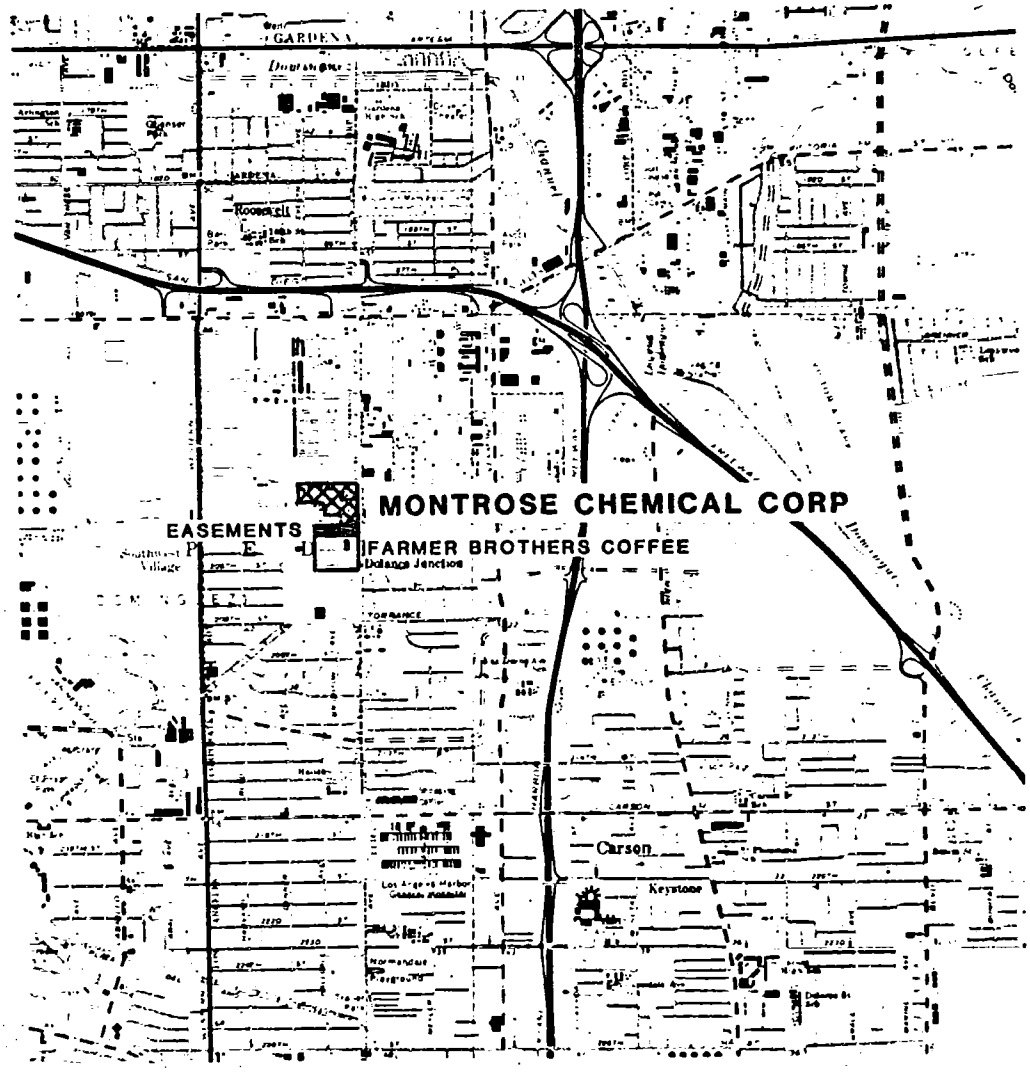
PURPOSE

The purpose of this document is to present a review of measures proposed by Montrose Chemical Corporation to remedy soil and surface runoff contamination with DDT at their Torrance, California, facility. The scope of this review is limited to the Montrose property and a roughly 0.5-acre area south of the property referred to as the easements (Los Angeles Department of Water and Power and Southern Pacific Railroad rights-of-way). No chemical contaminants other than DDT and its metabolites have been addressed.

Information reviewed included Environmental Protection Agency (EPA) case files (November 1982 to present); regional soil and hydrogeologic data; technical literature pertaining to the distribution, persistence, and mobility of DDT and related compounds in soil; and engineering data and plans of the proposed remedial action supplied by Montrose Chemical Corporation. No site visits were conducted by Metcalf & Eddy personnel.

DESCRIPTION OF SITE PROBLEMS

Montrose Chemical Corporation manufactured DDT at its Torrance facility (Figure 1) from 1947 to 1982. Since the plant ceased operation in 1982, all process equipment and buildings have been removed and/or demolished onsite. Stauffer Chemical Co. is now in the process of redeveloping the property as a warehouse facility.



APPROX SCALE 1"=3125'

FIGURE 1. VICINITY MAP

Since the early 1970s, a large body of evidence has been developed implicating the Montrose facility as a primary source of DDT contamination found in the sediment, seafood, and stormwater discharges to San Pedro Bay. Two major mechanisms of dispersion have been discussed in these reports: (1) aerial dispersion of particulate DDT, and (2) transport of DDT-laden sediments via stormwater runoff from the manufacturing facility and the larger area contaminated by aerial dispersion.

Although no air monitoring data are available to verify this, it is reasonable to assume that aerial dispersion has been significantly reduced since the plant ceased operation. In the future, this transport mechanism would be significant only during excavation or movement of contaminated materials. Since this is expected to be an episodic and transient problem, and we understand that most of the building demolition, including grinding of contaminated concrete rubble, has already occurred, we will address our comments mainly to the long-term feasiblility of the proposed remedial measure.

At present, the major pathway for further spread of DDT contamination is via sediment transport in stormwater runoff. Properties north and west of the Montrose plant, parts of which are unpaved, contribute to the stormwater that collects on the Montrose site and exits via an earthen ditch at the southeastern corner of the property. This ditch presently leads to a catchbasin located in the parking lot of Farmer Brothers Coffee, approximately 500 feet south of the Montrose property. From there, the runoff is conveyed underground to the city storm drain system.

Another pathway that should be considered is that of direct human contact with contaminated soil. At present, surface soils in unfenced areas of the easements south of Montrose and north of Farmer Brothers, show DDT concentrations as high as 1,975 ppm. Residential neighborhoods are only 500 feet away.

DDT and its metabolites, referred to simply as DDT in this report, are extremely persistent and bioaccumulative pesticides. DDT toxicity in humans has not been reported, but it is a suspected carcinogen. The relevant public health concern is the cumulative effect of eating fish containing high concentrations of the chemical. The FDA action level in fish tissue is 5 ppm. Other applicable standards include the water quality criteria for protection of human health (SNARL), which for DDT is 0.00024 ug/L (ppb) at the 10^{-5} risk level, and the fresh and saltwater aquatic life levels, which for DDT are 0.0010 ug/L (ppb) as a 24-hour average and 1.1 and 0.13 ug/L (ppb) as maximum limits, respectively.

Literature Review

Transport Mechanism. Most of the existing technical literature considers DDT in the concentrations found in agricultural settings (<1 to 80 ppm). In this context, three transport mechanisms are discussed. First, DDT does volatilize; this is considered a significant health issue during agricultural application of DDT to fields. The OSHA permissible 8-hour exposure limit for DDT is 1 mg/m^3; the ACGIH recommended short-term (15-minute) ceiling is 3 mg/m^3.

The second mechanism is aerial transport of DDT product in liquid, powder, or granular form. In Montrose's case, liquid DDT is not a problem, but aerial dispersion of powdered or granular DDT or of contaminated fine-grained soil particles

may be a transient problem. During excavation or movement of highly contaminated hot spots at Montrose, the combination of volatilization and aerial transport could result in excessive exposure to workers and possibly to the neighborhood.

The third mechanism is erosion of contaminated soil and DDT particles, which is the most significant long-term problem at the Montrose site.

Review of the chemical properties of DDT suggests a fourth possible transport mechanism. Although solubility of DDT in water is extremely low (0.001 to 0.04 ppm), its solubility in some common organic compounds is quite high (e.g., benzene, acetone, ether). While the literature shows that DDT leaching through soil with water is uncommon, these data suggest that a major chemical or petroleum spill on unprotected ground could mobilize higher concentrations of DDT, increasing the potential threat to surface waters and groundwaters. More complete discussion of DDT's behavior in soil may be found in Appendix A.

Potential for Groundwater Contamination. Based on a review of available soil, geologic, and hydrologic reports, and well logs obtained from the Los Angeles County Flood Control District, the Montrose site appears to have a low potential for DDT contamination of usable groundwater. Appendix A details the few documented cases of DDT migration; the conditions under which migration occurred do not appear to be present at the Montrose site. As shown in Appendix B, the site is underlain by up to 3 feet of granular soil and a layer 100 to 150 feet thick of sandy clay. Sand or gravel layers are found between 118 and 185 feet and between 458 and 547 feet.

Drinking water wells in Torrance and surrounding communities tap the Silverado aquifer, found at depths below 450 feet at the Montrose site (site is at approximately El. +50 ft). Water levels in nearby wells that are screened below elevations of -400 feet were measured at elevations of -10 to -20 feet. Given the low solubility of DDT in water; the thickness of fine-grained, relatively impermeable soils overlying the drinking water aquifer; and the high artesian pressure in the aquifer, it is unlikely that DDT could migrate through the soil profile to contaminate drinking water.

Regional reports describe the existence of a shallow unconfined aquifer of poor (brackish) water quality. The nearest observation wells screened in this aquifer are along the Dominguez Channel, more than 1 mile from the site; they indicate water levels close to sea level.

Results of Field Investigations

In November 1982, EPA's Technical Assistance Team sampled soils and runoff immediately southeast of the Montrose property in the vicinity of an unlined ditch that carried stormwater runoff away from the Montrose porperty. This investigation formed the basis for Enforcement Order No. 83-01 (Appendix F), which required Montrose to cease discharges of stormwater and to undertake an investigation to determine the extent of contamination. To comply with the latter provision, Montrose sampled onsite soils during June, July, and August of 1983.

Soil sample results of both investigations have been compiled in Tables 1 and 2 and plotted in Figure 2. Figures 3, 4, and 5 show plots of Montrose's results at different depths below ground surface.

Table 1. SUMMARY OF ONSITE SOIL DDT CONCENTRATIONS

Sampled by	Date	Depth interval, ft	Total No. of samples	Range of DDT concentrations, ppm	<10 ppm	10-100 ppm	100-1,000 ppm	1,000-10,000 ppm	>10,000 ppm
EPA-TAT	11-10-82	0-1	7	10-1,246	0	0	6	1	0
Montrose	6-15-83 to 8-10-83	0-1	31	5.6-95,000	4	5	12	7	3
		1-2	30	0.063-59,000	9	12	4	2	3
		2-3	19	0.072-810	9	7	3	0	0
		3-4	8	0.028-31	5	3	0	0	0
		4-5	4	0.028-12	3	1	0	0	0
		5-6	5	0.033-4.1	5	0	0	0	0
		6-7	3	0.053-4.1	3	0	0	0	0

Note: Many soil samples were composites spanning more than one depth interval (e.g., 18-30 in.). In this table, in order to obtain the maximum number of sample points in each depth interval, each sample has been counted twice (e.g., an 18-30 in. sample would be counted in the 1-2 ft interval and in the 2-3 ft interval).

Table 2. SUMMARY OF OFFSITE SOIL DDT CONCENTRATIONS

Sampled by	Date	Depth interval, ft	Total No. of samples	Range of DDT concentrations, ppm	<10 ppm	10-100 ppm	100-1,000 ppm	1,000-10,000 ppm	>10,000 ppm
EPA-TAT	11-10-82	0-1	3	24-1,075		1	0	2	0
Montrose	6-15-82 to 8-10-82	0-1	8	15-990	0	3	5	0	0
		1-2	10	0.086-2,400	5	0	2	3	0
		2-3	6	0.086-1,900	4	0	1	1	0
		3-4	2	0.08-1.3	2	0	0	0	0
		4-5	3	0.08-3.0	3	0	0	0	0
		5-6	1	3.0	1	0	0	0	0

Note: Many soil samples were composites spanning more than one depth interval (e.g., 18-30 in.). In this table, in order to obtain the maximum number of sample points in each depth interval, each sample has been counted twice (e.g., an 18-30 in. sample would be counted in the 1-2 ft interval and in the 2-3 ft interval).

CHRONOLOGY OF ENFORCEMENT ACTIVITY

Table 3 lists the written communications between Montrose Chemical, EPA, and the Regional Board regarding the issues of soil and surface runoff contamination with DDT. Copies of the enforcement orders may be found in Appendix F; other correspondence is available in EPA's files.

Table 3. CHRONOLOGY OF ENFORCEMENT ACTIVITY CORRESPONDENCE

Date	By	To	Summary
12-23-82	EPA	Montrose	Notification of ongoing CERCLA investigation.
02-04-83	Montrose	EPA	Information requested under CERCLA.
04-11-83	EPA	--	Final report of investigation showing high DDT levels in runoff and offsite soils.
05-06-83	LARWQCB	Montrose	Cleanup and Abatement Order No. 83-1. Provisions: • Cease stormwater discharge • Sample soils • Implement remedial program
05-06-83	EPA	Montrose	CERCLA Section 106 Order No. 83-01. Provisions: • Cease DDT discharges • Contain stormwater within 30 days • Sample soils for DDT and MCB • Prepare remedial program • Sample stormwater every storm event
05-27-83	LARWQCB	Montrose	Amended CAO No. 83-1 - extended deadline.
06-23-83	Montrose	EPA and LARWQCB	Actions taken: temporary dike built; onsite ditch cleaned and lined. Proposed actions: pave site; curbs around site; offsite ditch cleaned and lined; sample soil.
07-08-83	LARWQCB	Montrose	Temporary dike does not relieve responsibility to cease discharge; need details of capping plan; advise future owner; more offsite sampling needed; no excavation until approval given.
07-12-83	EPA	Montrose	Temporary dike does not relieve responsibility to cease discharge; no paving until sample results reviewed; offsite sampling needed.
07-27-83	Montrose	EPA	Submittal of preliminary soil sample results (50 samples)
08-31-83	Montrose	EPA	Complete soil sample results and cost estimates requested in meeting of 08/04/83.
09-20-83 09-21-83	LR&D	EPA	Additional details on sampling plan.
11-10-83	Montrose	EPA	Reporting additional interim remedial measures taken and request prompt approval of sealing plan.

EPA = Environmental Protection Agency, Region 9
Montrose = Montrose Chemical Corporation, respondent
LARWQCB = Los Angeles Regional Water Quality Control Board
LR&D = Landels, Ripley & Diamond, attorneys for Montrose

DESCRIPTION OF PROPOSED RESPONSE

To control surface water run-on and subsequent runoff of DDT-contaminated sediments, Montrose Chemical Corporation has proposed a remedial plan that involves surface sealing of the property (capping) and stormwater control reproduced in its entirety in Appendix D. Montrose states that DDT migration can only result from erosion by surface runoff at this site, but has not yet provided any technical information to support this contention. The capping plan dated August 1, 1983, prepared for Montrose Chemical by James O'Malley & Associates Inc., of Corona, California is summarized as follows:

Proposed Surface Sealing Provisions

- Western 3 acres is not planned for buildings or outside storage operations and will be dormant in the future. This area will be capped with 2-in. unreinforced concrete over prepared subgrade.
- Roadways and parking areas around Buildings A and B will be capped with 6-in. asphalt concrete over 8-in. aggregate base.
- Truck hardstands adjacent to Buildings A and B will be capped with 6-in. concrete over prepared subbase.
- Floor areas for Buildings A and B will be covered with 6-in. decomposed granite or slag, with concrete floors and buildings to be built at some future date (after the rainy season?).
- Former waste pond will be covered with the floor of Building B.
- Four-step maintenance plan:
  - Stauffer will manage property and repairs would be made in dry season or protected.
  - Weekly walk-around, quarterly inspections by paving contractors.

location (Class I landfill); or capping with reinforced concrete, asphalt concrete, a soil-bentonite mixture, or synthetic liner. Detailed descriptions of these alternatives are given in Appendix E and are summarized in Table 4.

Table 4. ALTERNATIVE SURFACE SEALING PROVISIONS

Alternative	Description	Advantages	Disadvantages	Costs, $/ft^2[a]
1. Excavate	Remove soil; dispose of in Class I landfill	No future risk at site; no future maintenance; no capping needed.	Additional sampling needed to verify completion; reduction in landfill capacity; potential spills in transit; aerial transport during excavation	$ 5.50 (1-ft deep) $11.00 (2-ft deep) $16.50 (3-ft deep)
2. Reinforced concrete	4-in. wire mesh-reinforced concrete on 6-in. aggregate base	Relatively long design life; usable as open storage; easy repairs	Maintenance required; susceptible to cracking and chemical deterioration	$ 1.60
3. Asphalt concrete	2-in. asphalt concrete on 8-in. aggregate base	Can accept moderate distortion; usable as open storage; easy repairs	Maintenance required; slightly susceptible to cracking and chemical deterioration	$ 0.97
4. Soil-bentonite	12-in. clean soil and vegetative cover on 6-in. clean soil mixed with bentonite to form minimum 4-in. thick soil-bentonite layer	Flexible; self-healing; cost effective where excavation/replacement is needed	Maintenance required; susceptible to erosion if cover is breached; special precautions to maintain seal if future excavation occurs	$ 1.25
5. Synthetic liner	12-in. clean soil with vegetative cover on liner on 6-in. clean soil	Flexible; design life >30 years; not susceptible to cracking or chemical deterioration	Slight maintenance required	$ 1.54

a. As estimated for 3-acre area.

construction plans. The issue of worker safety has not been addressed; nowhere in the construction plans or specifications is there any mention of hazardous materials. During construction, air monitoring for DDT and dust should be done, and provisions should be made to protect the health of site workers and nearby population and prevent further dispersion of the contamination. Dust should be controlled during earth moving, and tracking of DDT off the site via clothing or vehicles should not be allowed. All monitoring, safety, and construction practices should conform to applicable county, state, and federal health and safety codes.

The permanent remedial measure proposed for this site is a relatively impermeable cap over soil containing high concentrations of DDT. In the process of redevelopment, future property owners may cut through the cap, potentially discharging DDT into the environment again. Restrictions should be placed on the title to the Montrose property stating, as a minimum, that the property contains hazardous waste, a description of the contamination, and including provisions for maintenance of the cap and control of any future earthwork done on the site.

There are several on-site areas of extremely high DDT concentrations that, as proposed by Montrose, may be moved within the site but will remain on the property beneath the cap. If the integrity of the cap is maintained, the design proposed by Montrose, with the modifications recommended below, should be sufficient to control further releases of this contaminated material. Performance of any long-term maintenance program cannot be guaranteed even though, theoretically, the integrity of the cap can be preserved if the facility is not altered and proper maintenance is performed.

Surface Sealing Provisions. Two-inch unreinforced concrete, as proposed for the western 3 acres, is not an adequate cap. Concrete is rigid and will crack if loaded beyond capacity. Wire-mesh reinforced concrete 4 inches thick, asphalt concrete, or a flexible cap of soil-bentonite or a synthetic liner would be acceptable solutions.

The aggregate bases for Buildings A and B, which may contain crushed contaminated concrete, should not be left exposed during the rainy season. A synthetic liner can be installed beneath the aggregate if no contaminated concrete is used, or the concrete slabs themselves should be placed promptly.

Stormwater Provisions. As part of the maintenance plan, it is recommended that an enclosed stormwater detention basin be constructed at the southeast corner of the property. The chamber would catch and retain DDT-contaminated sediment that may have entered the surface runoff system, preventing sediment discharge to the city stormwater system. Periodic monitoring should be performed to determine the effectiveness of the remedial action. If it is found that the sediment collected contains hazardous levels of DDT, it should be disposed of in accordance with applicable federal and state requirements.

Curb design as shown in the construction plans does not prevent stormwater runoff from other properties from entering the Montrose site. The 6-inch curb is more than 2 feet below ground surface at the property line at many places, and some of these contributory areas are unpaved. Curb/paving design should be modified to accomplish the intended purpose.

Plans show more than 2,000 feet of high pressure water lines on the property, crossing areas containing DDT concentration in the 1000s of ppm. Any high pressure liquid lines should be installed in concrete box culverts to prevent massive DDT discharges in the event of a break.

Design calculations show that the trapezoidal channel conveying runoff from Montrose to near the Farmer Brothers catchbasin is sized only for a 25-year storm. All stormwater management structures, including curbing around the site, should be sized for the 100-year storm.

Case records show other corrosive chemicals were used at the Montrose site (caustics and strong acids). The soils should be evaluated for corrosivity before final selection of pipe materials is made. Corroded pipes provide avenues for DDT-laden sediments to enter the storm drain system and thence into San Pedro Bay.

Conveying stormwater across pavements and in open channels may result in puddling of water and provide the potential for erosion and sediment transport due to the additional flow in areas that will cover very high DDT concentrations. In addition, oils that will collect on the pavements have the potential to dissolve much of the DDT that may be present in the sediments. Therefore, stormwater should be conveyed in subsurface pipelines rather than above ground. One stormwater pipeline is routed beneath Building B. Because a pipeline beneath a building cannot easily be repaired, it should be rerouted around the perimeter of the building. All pipelines should be protected from infiltration/exfiltration.

An earthen dike, built in response to the Enforcement Order provision to cease stormwater discharge, currently exists at

the southeastern corner of the property. Because most of the site is presently unpaved, contaminated sediment may be collecting on the retention side of the dike. In addition, the dike itself may have been constructed of contaminated soil. Upon completion of site development, the dike material and sediment should either be completely capped, excavated and properly disposed of offsite, or adequately tested to show DDT levels no higher than background.

Offsite Measures

South of the Montrose property, DDT contamination up to 2,400 ppm has been measured in the soil along an open ditch that crosses the easements (Southern Pacific Railroad and Los Angeles Department of Water and Power). Elsewhere in the neighborhood, the Los Angeles County Health Department has sampled soil to determine the local background concentration of DDT. Surface background samples ranged from 1.41 ppm to 4.85 ppm; at 18 inches no DDT was detected.

Interim. Montrose has not proposed any remedial action beyond their property boundaries, but the necessity for both immediate and permanent remediation is clearly indicated. Due to the proximity of residential neighborhoods, it is recommended that temporary fencing be installed immediately to surround that part of the easement that exceed background levels (say 5 ppm DDT).

Permanent. There are two acceptable alternatives for the permanent remedial action. Contaminated soil can be excavated to background levels and disposed of in a Class I landfill or the contaminated area may be capped with a synthetic liner and clean soil. The other three capping methods (concrete, asphalt, and soil bentonite), while feasible, are not

appropriate for the following reasons. The easements contain buried pipelines and conduits, to which access is periodically needed. The same maintenance program and deed restrictions that will be applied to the Montrose property would be necessary to ensure the integrity of the easement cap. Even if those restrictions were accepted, because this land is outside of Montrose's control, enforcement is more difficult. Also, there is nothing unusual in appearance about concrete, asphalt, or clay soils that would alert an uninformed excavator to the unusual conditions there and the need to restore the surface seal to its original condition and, in the case of bentonite, to segregate the materials found above and below it.

As shown in Table 4, the synthetic liner alternative has a clear cost advantage over excavation; however, formal agreements with Southern Pacific and the Los Angeles Department of Water and Power would still be needed to guarantee proper maintenance.

If the excavation alternative is selected, air monitoring and dust control should be performed and proper health and safety procedures be established and followed to protect workers and nearby residents, in accordance with federal, state, and local codes. In addition, random soil samples should be taken at the completion of excavation to verify that background DDT concentrations have been reached.

Regardless of whether excavation or synthetic liner is chosen, it is recommended that the stormwater collected on the Montrose property be conveyed across the easements directly to the city sewer rather than to a private catchbasin.

When construction of the stormwater system has been completed, the connection to Farmer Brother's Coffee catchbasin should be broken and properly sealed and all contaminated sediment should be removed from the catchbasin and properly disposed of.

RECOMMENDED MODIFICATIONS TO PROPOSED RESPONSE

Table 5 summarizes the recommended modifications to the capping plan proposed by Montrose. If all of these modifications are made, the result will be a conservatively designed containment that will minimize the chances of further accidental releases of DDT into the environment. Where possible, the modifications have been expressed in general terms, to allow the respondent the flexibility to find the most cost-effective solution that fits their development needs while accomplishing the environmental goals.

Table 5. RECOMMENDED MODIFICATIONS TO MONTROSE CHEMICAL CORPORATION'S PROPOSED CAPPING PLAN

ONSITE REMEDIAL MEASURES

General Provisions

- Establish worker safety program, including air monitoring.
- Deed restriction, including maintenance program.

Surface Sealing Provisions

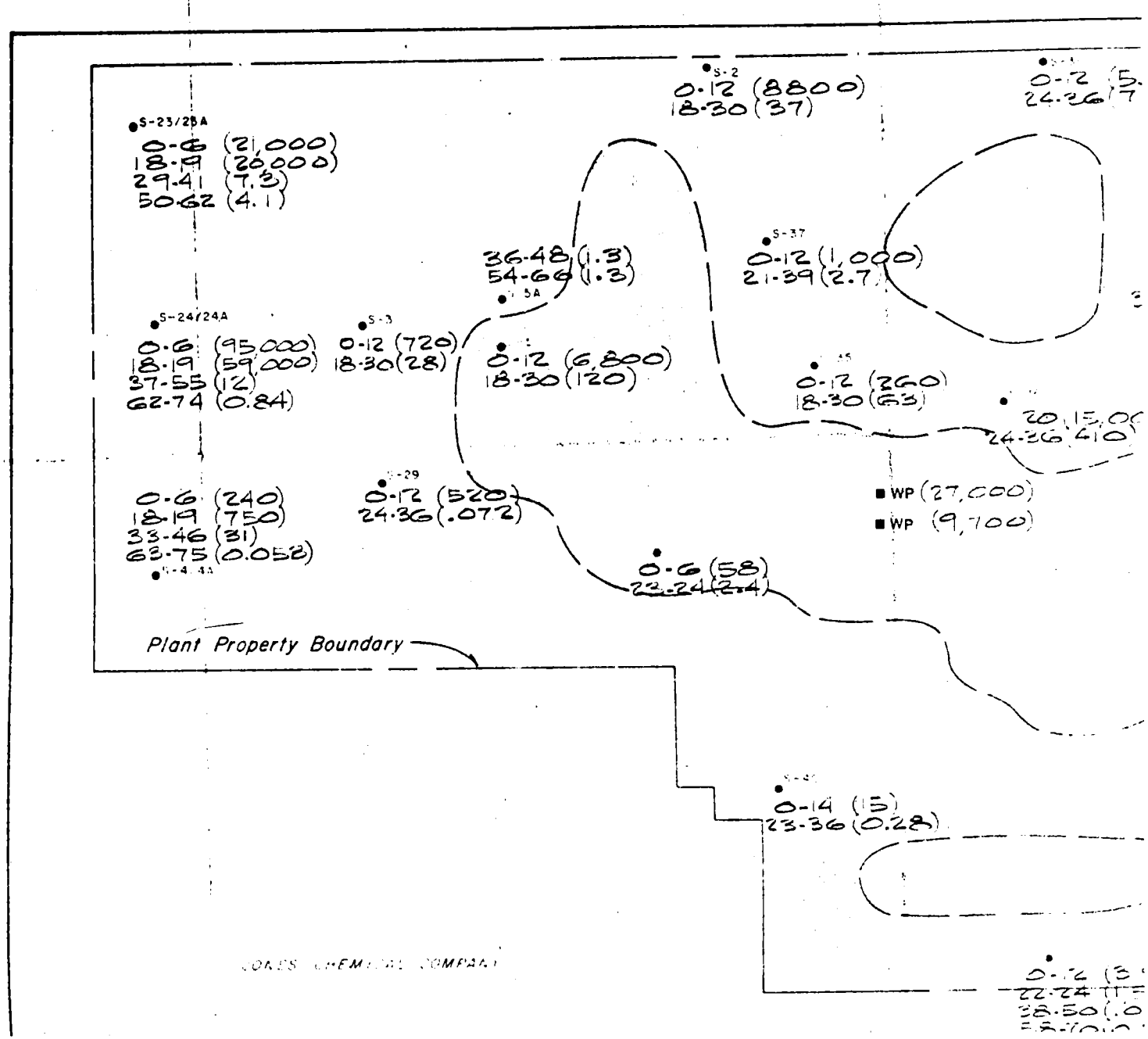
- Improve cap on western 3 acres.
- Seal aggregate base for buildings before rainy season.
- Existing contaminated concrete should not be reused in fresh concrete.

Stormwater Provisions

- Construct detention basin to prevent sediment from leaving site.
- Monitor runoff periodically for DDT.
- Modify curb design to prevent run-on from any exposed soil or parking lots.
- Buried high pressure liquid pipelines should be installed in concrete box culvert (e.g., fire mains, water supply lines).
- Size all stormwater collection/conveyance structures for 100-yr storm.
- Evaluate soils for corrosivity before selecting pipe materials.
- Convey stormwater via buried pipelines rather than open channels.
- Route pipelines around buildings, not beneath.
- Make all pipelines infiltration/exfiltration-proof.

OFFSITE REMEDIAL MEASURES

- Immediately provide temporary fencing around areas >5 ppm DDT
- Easements should be either:
  - Excavated to local background DDT level, or
  - Sealed with synthetic liner and clean soil
- Convey Montrose runoff directly to city storm drain instead of to another private property.
- Remove contaminated sediment from Farmer Brother's Coffee catchbasin.

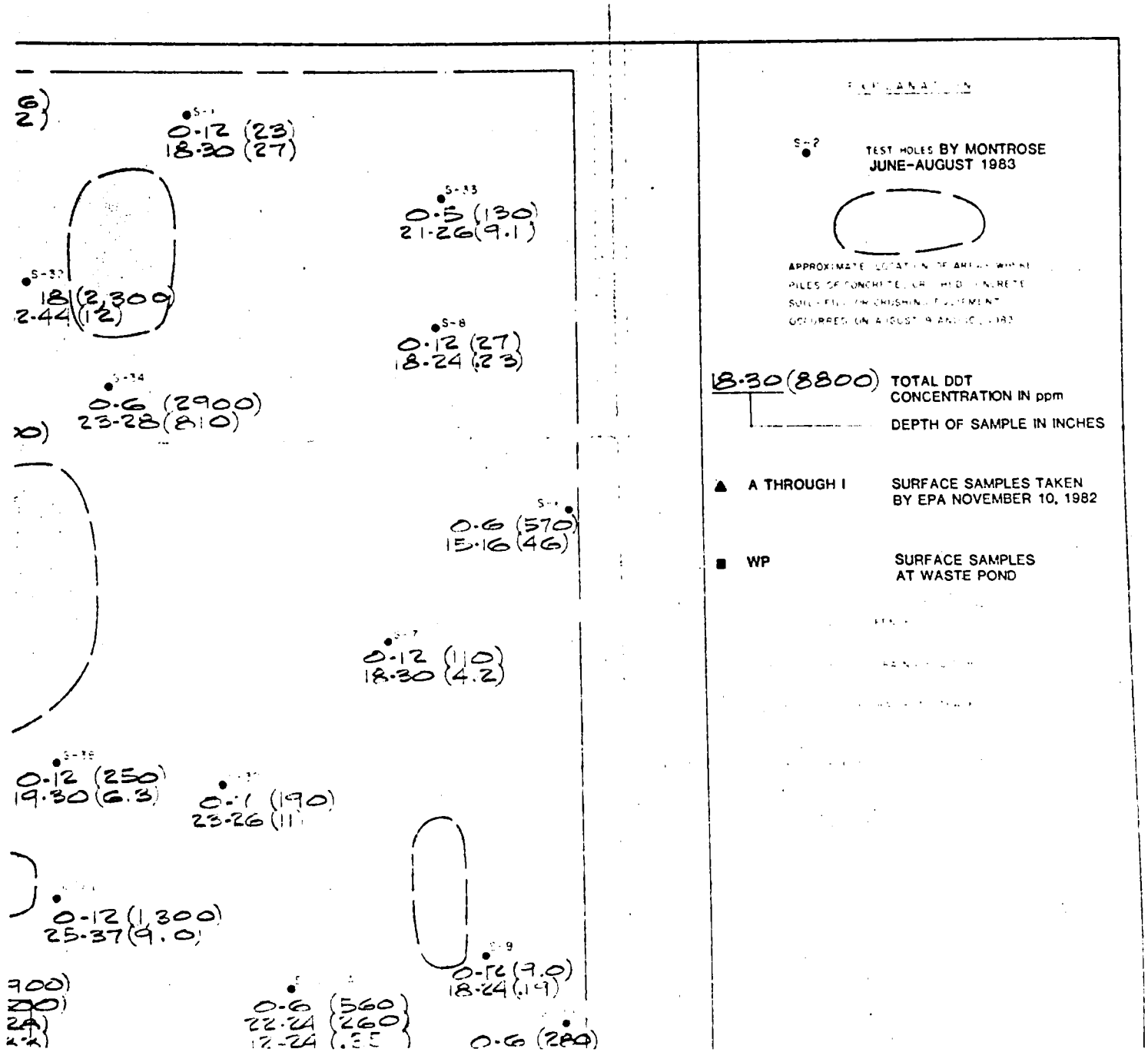


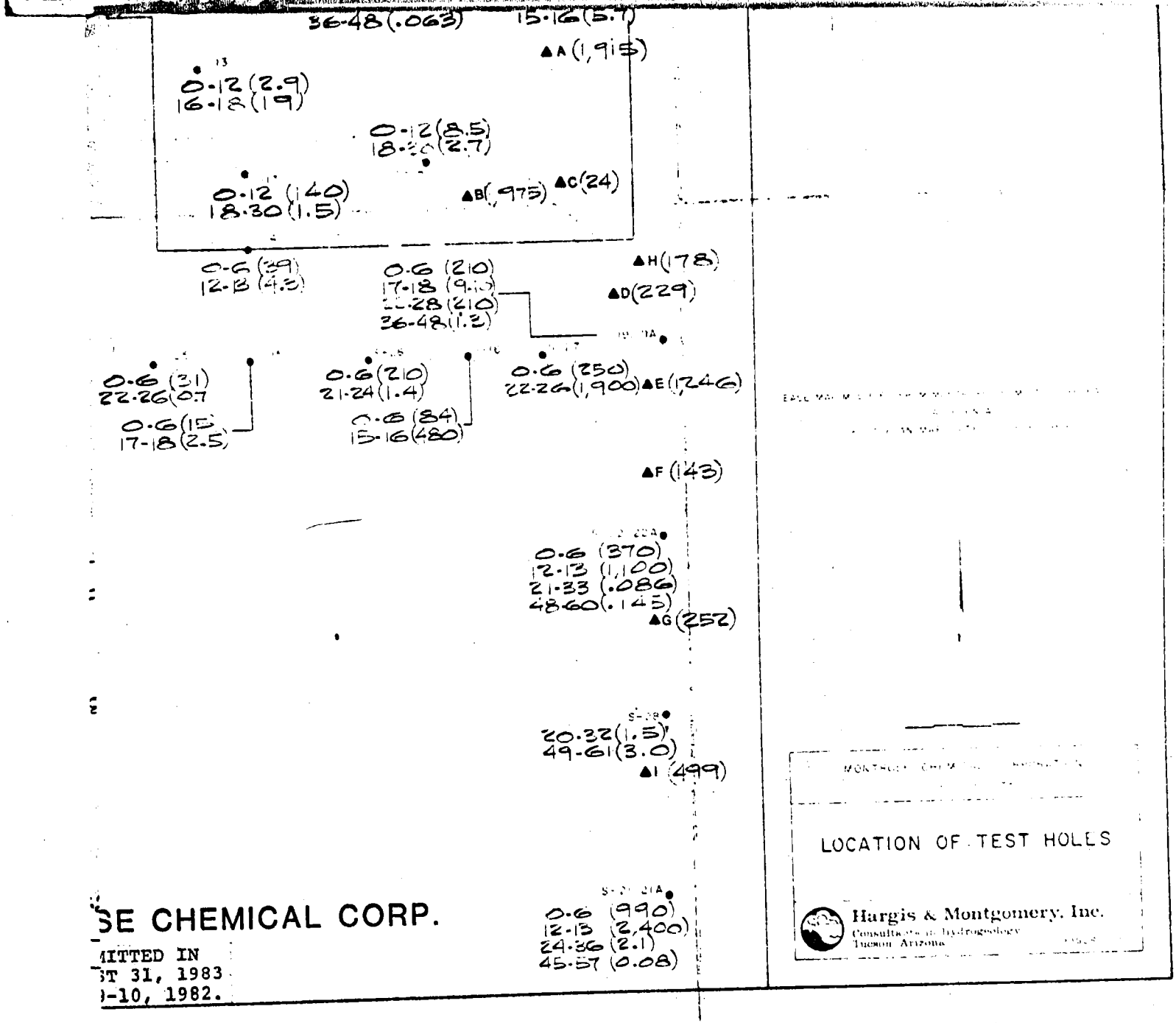
CRUSHED CONCRETE FROM DEMOLISHED BUILDINGS : 280 ppm
640 ppm
250 ppm

FIGURE 2

RESULTS OF SOIL SAMPLING AT MONTRO

PLOTTED BY METCALF & EDDY FROM RESULTS TRANS
MONTROSE CHEMICAL CORP. LETTER TO EPA OF AUGU
AND CERCLA INVESTIGATION CONDUCTED NOVEMBER





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ST 31, 1983
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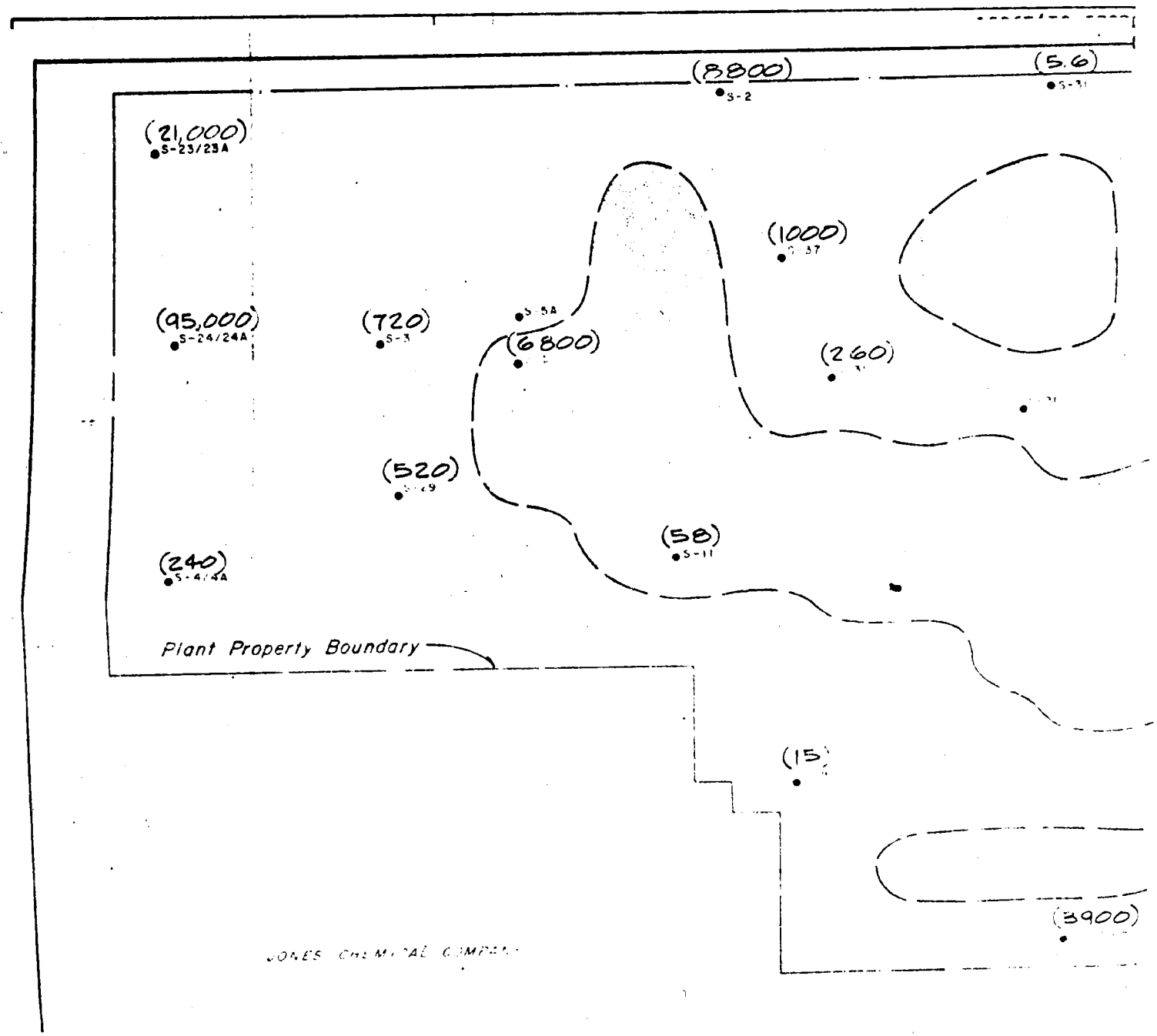

FIGURE 3

TOTAL DDT CONCENTRATIONS AT

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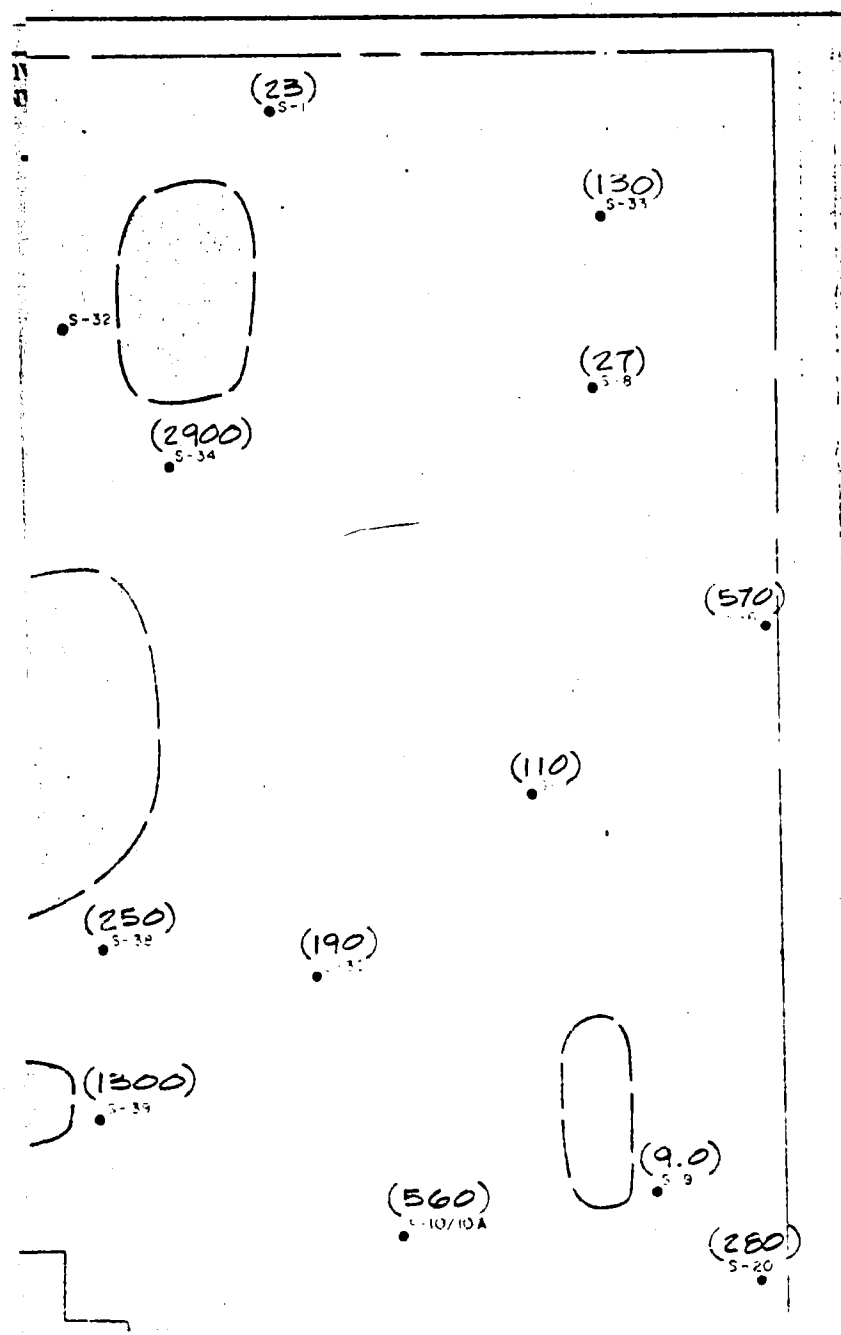
MONTROSE CHEMICAL CORP. LETTER TO EPA OF A

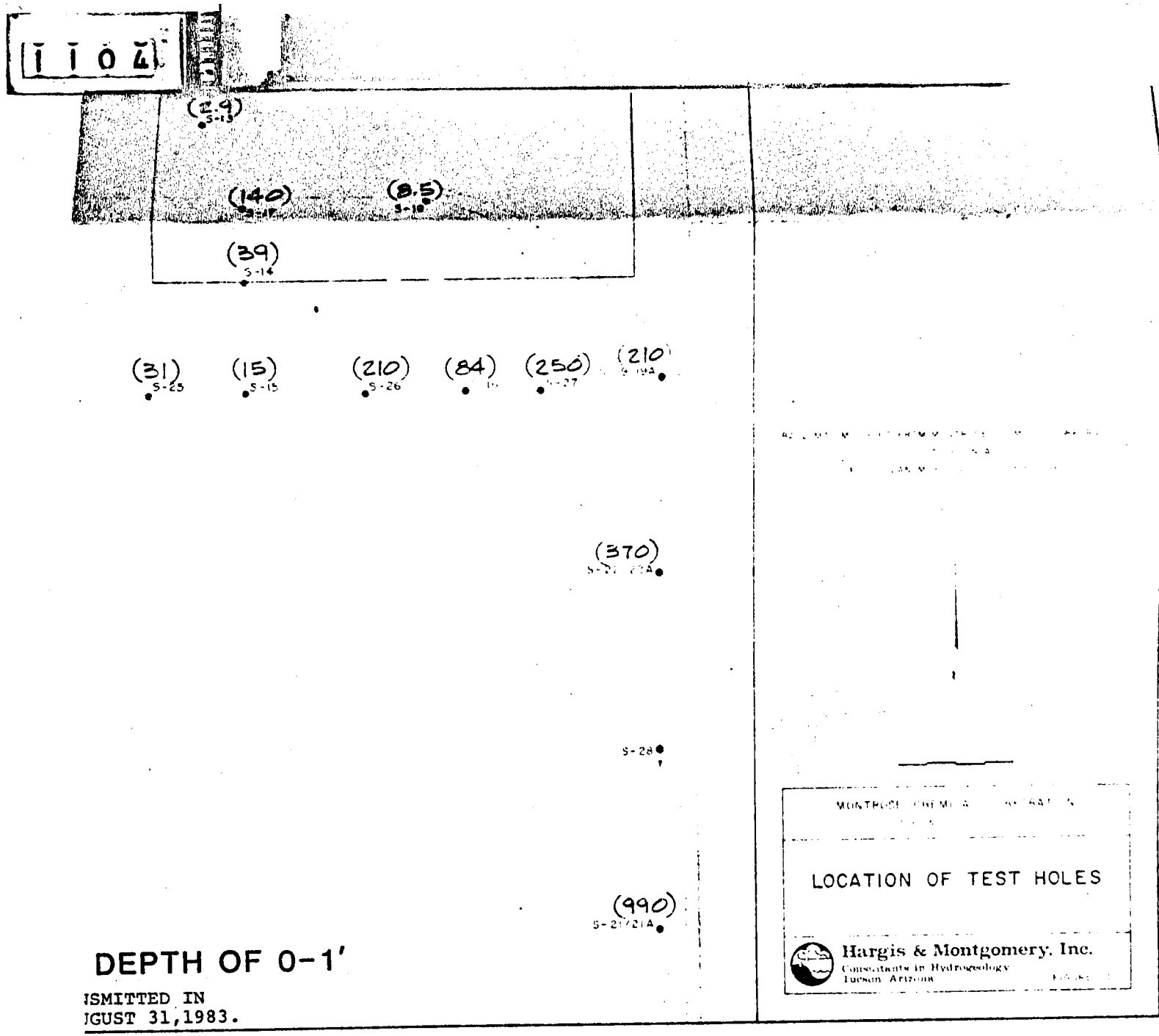


EXPLANATION

S-2 TEST HOLES

APPROXIMATE ISOLATION OF AREAS WHERE PILES OF CONCRETE, CHLORELLA PLOTS, SOIL TEST OR ERIGHAN EQUIPMENT OCCURRED IN AUGUST AND NOVEMBER 1955

(23) TOTAL DDT CONCENTRATION IN ppm



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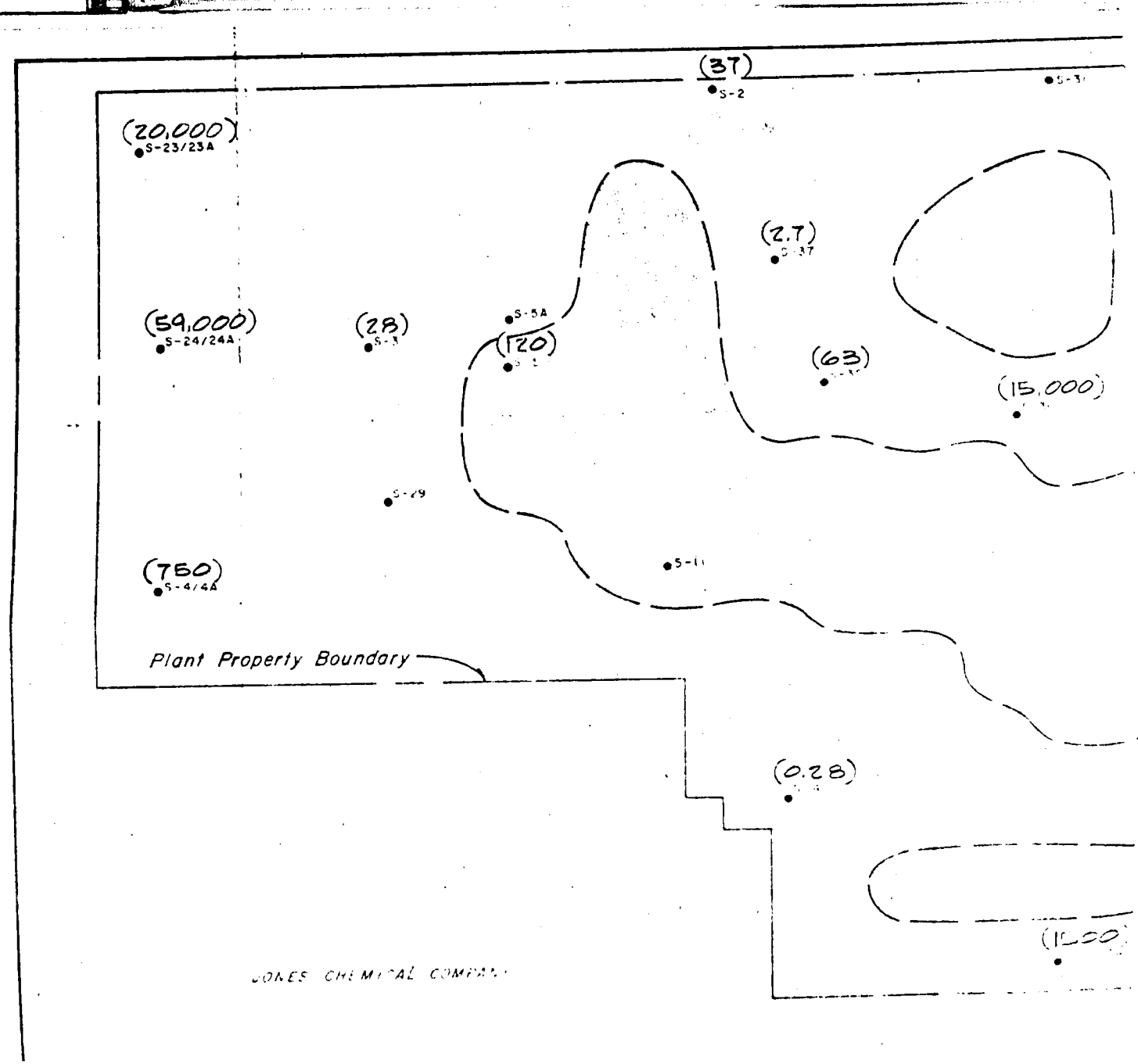
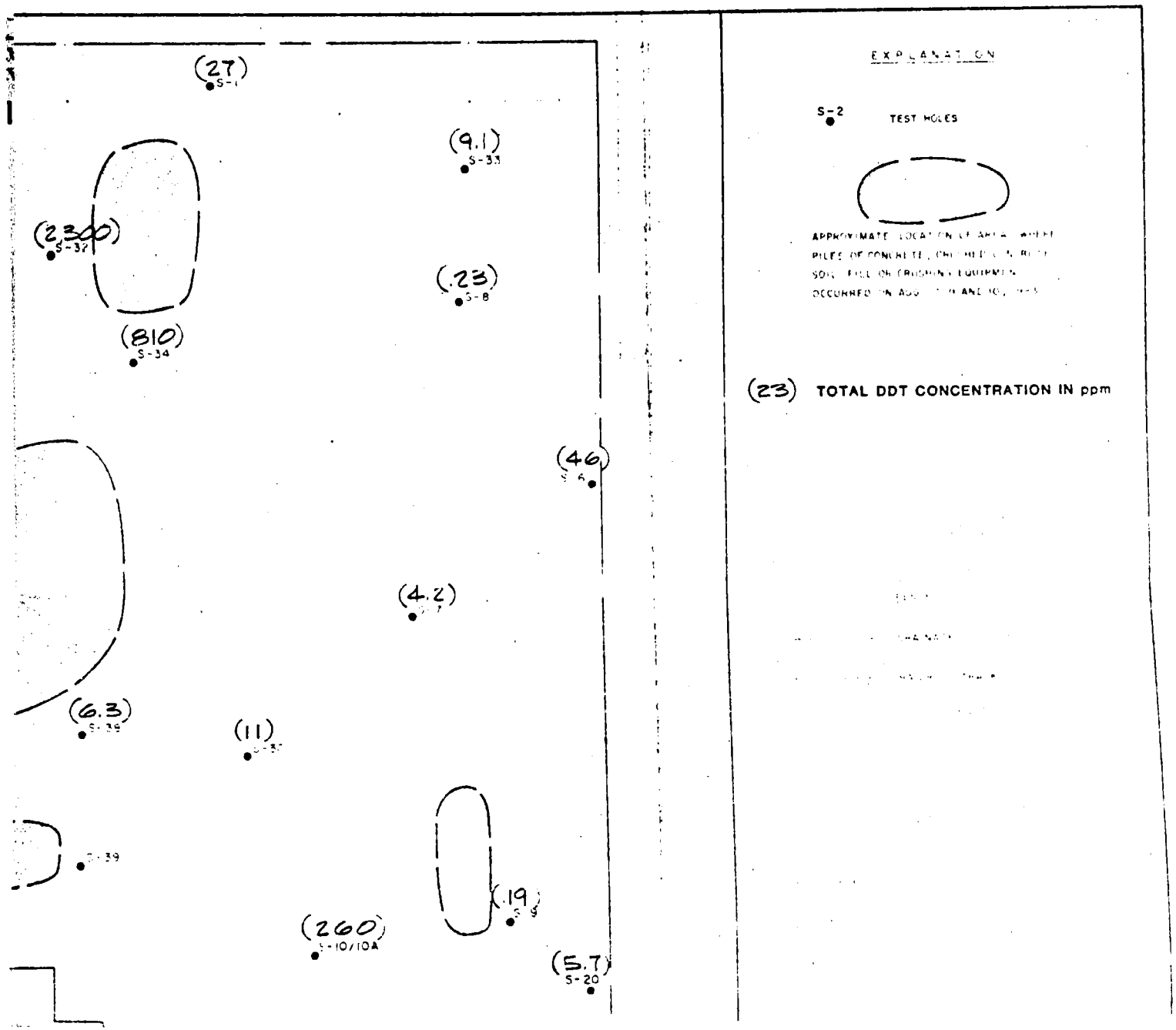


FIGURE 4

TOTAL DDT CONCENTRATION AT I

PLOTTED BY METCALF & EDDY FROM RESULTS TRA
MONTROSE CHEMICAL CORP. LETTER TO EPA OF A



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(19) S-13

(1.5) S-17

(2.7)

4.3 S-14

(0.6) (2.5) S-15 (1.4) (480) (1900) (940)

(1100)

(1.5) S-28

(2400) S-21/21A

DEPTH OF 1-2'

NSMITTED IN
UGUST 31,1983.

MONTROSE CHEMICAL CORPORATION

LOCATION OF TEST HOLES

Hargis & Montgomery, Inc.
Consultants in Hydrogeology
Tucson, Arizona

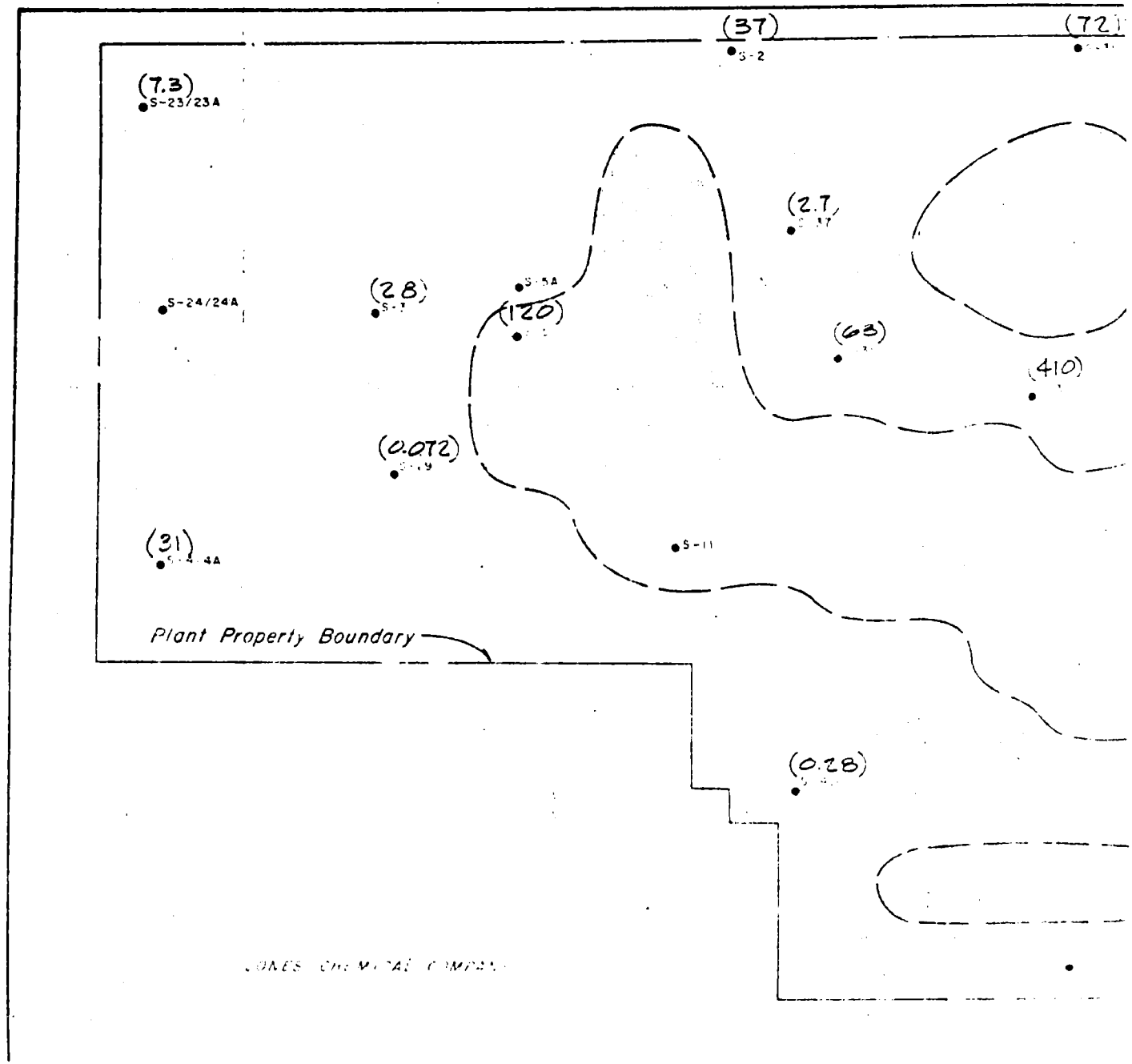
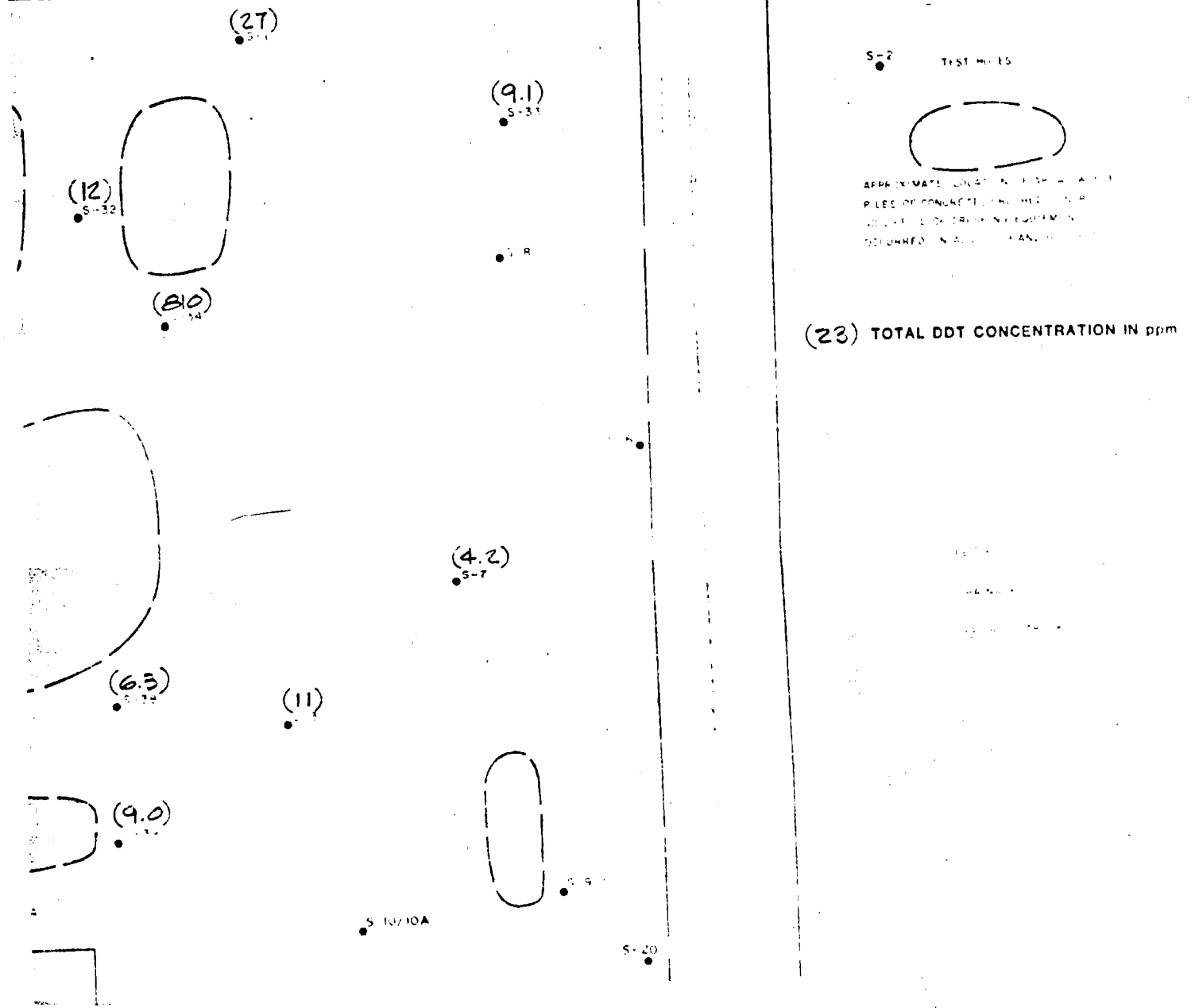
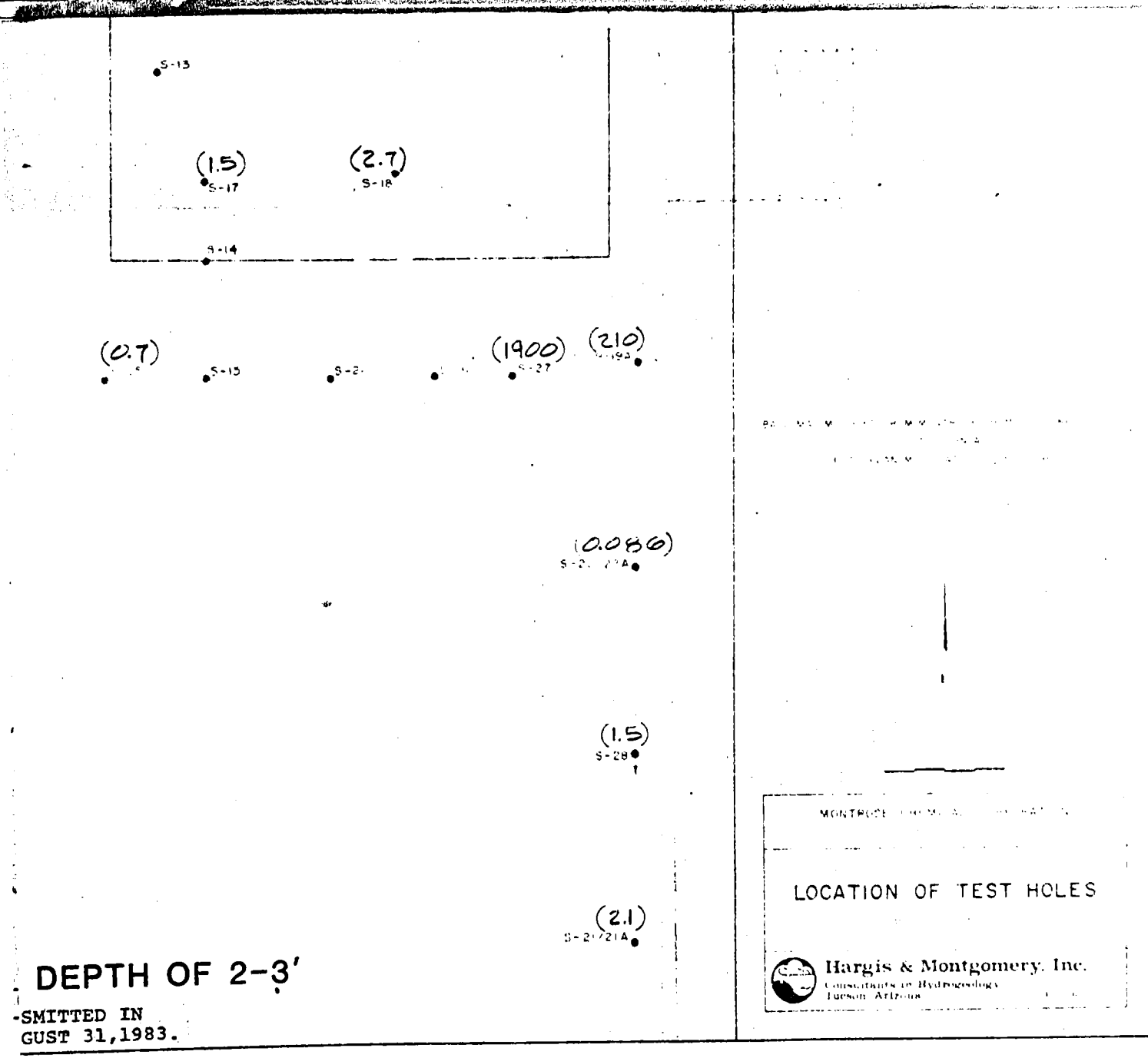


FIGURE 5

TOTAL DDT CONCENTRATIONS AT

PLOTTED BY METCALF & EDDY FROM RESULTS TRAN
MONTROSE CHEMICAL CORP. LETTER TO EPA OF AU





DEPTH OF 2-3'

-SMITTED IN
GUST 31,1983.

Appendix A

FATE AND BEHAVIOR OF DDT

Appendix A
LITERATURE REVIEW - DDT IN SOIL

FATE AND BEHAVIOR OF DDT

Persistence

DDT and its metabolites are considered to be some of the most persistent pesticides in soil. DDT has been detected in agricultural soils at least 10 years after application [1, 2]. In studies of some agricultural soils, levels of accumulated DDT ranged from approximately 1 to 80 ppm, as shown in Table A-1 [2-6]. Persistence has also been related to formulation, with granules persisting longest followed by emulsions, miscible liquids, and wettable powders and dust [7].

Table A-1. LEVELS OF DDT ACCUMULATED IN AGRICULTURAL SOILS
ppm

Reference	Level
Terriere et al., 1966	34-83[a]
Harris, 1970	
Orchard Soils	61.8
Vegetable fields	9.5
Tobacco fields	3.2
Other cultivated or pasture soils	<2
Bradley et al., 1972	0.09-1.78
Hubbell et al., 1973	6-8
Novoty, V., and G. Chesters, 1981	
Higher levels	80
Lower levels	1-2
Spencer et al., 1974	16-18
Stojanovic et al., 1972, Research Experiment	5,344[a]

a. Assumes incorporation in 0-15 cm depth and soil bulk density = 1.4 g/cc.

Soil microorganisms have been shown to convert DDT primarily to DDE and DDD [9]. A number of other byproducts have also been isolated in soils [9]. Under aerobic conditions, considerable DDT is converted to DDE and can be lost from the soil through volatilization [10, 11]. Based on available information, DDE does not degrade readily in soil [12]. In addition, DDE has been implicated as a major factor in eggshell thinness [13]. Under anaerobic conditions, DDT can be converted to DDD, with rates of conversion increased in the presence of readily decomposable organic matter [14]. According to some investigators, DDD is more biodegradable than DDE [14]. Also, this degradation pathway is considered to be more favorable, since it converts more of the DDT to DDD and thereby should reduce overall DDE levels in soil and the atmosphere [14-16]. Full-scale field reduction of DDT by anaerobic degradation has not been completely researched and researchers have found DDT to inhibit microbial activity at extremely high concentrations of approximately 5,000 ppm [17]. In summary, the practicality and feasibility of large-scale soil degradation of DDT has not been demonstrated. In addition, both DDD and DDE are relatively stable byproducts themselves.

Mobility

The majority of available literature reports DDT as being one of the least mobile of all pesticides [18-22]. Solubility of DDT in water is very low, ranging from 0.001 to 0.4 ppm [9].

Leaching

The low solubility in water and significant adsorption to soil are major factors controlling the very low leaching mobility of DDT. Adsorption on soils appears to correlate more with organic matter content than any other soil property [9, 23-25]. Mechanisms for soil adsorption apparently are related to partitioning at hydrophobic surfaces or at interfaces of various forms of soil organic matter [9].

Movement in soil to shallow groundwater is rare; however, a few cases have been reported. In Texas, DDT concentrations in a seep were detected from a field investigation and ranged from 0.0002 to 0.0012 ppm [26]. The soil was a heavy clay that is susceptible to shrinking and cracking upon drying. Other reported cases were in sandy soils in South Carolina and tile-drained soils in California [27]. Deeper groundwater contamination was reported in one instance, where contaminated soil was used to backfill a well casing [28].

Movement of DDT in forest soil profiles has been reported in a few cases [29-32]. Evidence suggests that the movement was associated with soil humic acids and results in 20- to 30-fold increases in solubility compared to water [31, 32]. Based on these data and other chemical data (which characterize DDT as very soluble in acetone, benzene, and ether), enchanced movement or solubility of DDT may be possible under field conditions [33]. The actual solubility in these nonpolar solvents was not quantified.

In summary, the bulk of the literature derived from studies of DDT accumulation in soils at agricultural levels indicates DDT does not leach in most soil-water systems. Some data and inferences from chemical properties, however, suggest solubility can be enhanced where significant quantities of humic acid are present, perhaps in soil environments where nonpolar organic solvents such as benzene or acetone are predominant. Areas of particular concern would be where shallow groundwater exists and the soils are very coarse textured, develop cracks through shrinking and swelling (vertisols), or are underlain by fractured or cavernous limestone.

Surface Runoff

Although DDT has low solubility in water, surface runoff appears to be a major transport pathway. The bulk of available data on pesticides in runoff refers to the combination of both water soluble and suspended oil-pesticide complex particles. Actual transport of DDT in runoff is believed to be predominantly by means of soil-pesticide complexes that are dislodged and suspended during soil erosion [5, 34].

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Appendix B

GROUNDWATER DATA

Appendix B
GROUNDWATER DATA

CONTENTS

Appendix B
GROUNDWATER DATA

SUMMARY

Based on a review of available soil, geologic, and hydrologic reports, the Montrose site appears to have a low potential for DDT contamination of usable groundwater. Logs of borings up to 6-ft deep made in 1983 show a maximum of 3 feet of granular fill (less than 1 foot over most of the site) overlying fine-grained, very low permeability soils. Logs of three wells drilled in 1942 within 1,000 feet of the site classify the upper 118 to 157 feet of soil as clay and sandy clay. Sand or gravel layers are found at depths of 458 to 475 feet (upper surface), with a layer of fine sand noted between 118 and 185 feet.

Drinking water wells in Torrance and surrounding communities tap the Silverado aquifer, found at depths of more than 450 feet below the Montrose site. Given the low solubility of DDT in water; the thickness of fine-grained, relatively impermeable soils overlying the drinking water aquifer; and the high artesian pressure on the aquifer, it is unlikely that DDT could migrate through the soil profile to contaminate drinking water.

Regional reports describe the existence of a shallow unconfined aquifer of poor (saline) water quality. The nearest observation wells screened in this aquifer are located along the Dominguez Channel, 1 to 2 miles northeast of the Montrose site and they indicate water levels close to sea level.

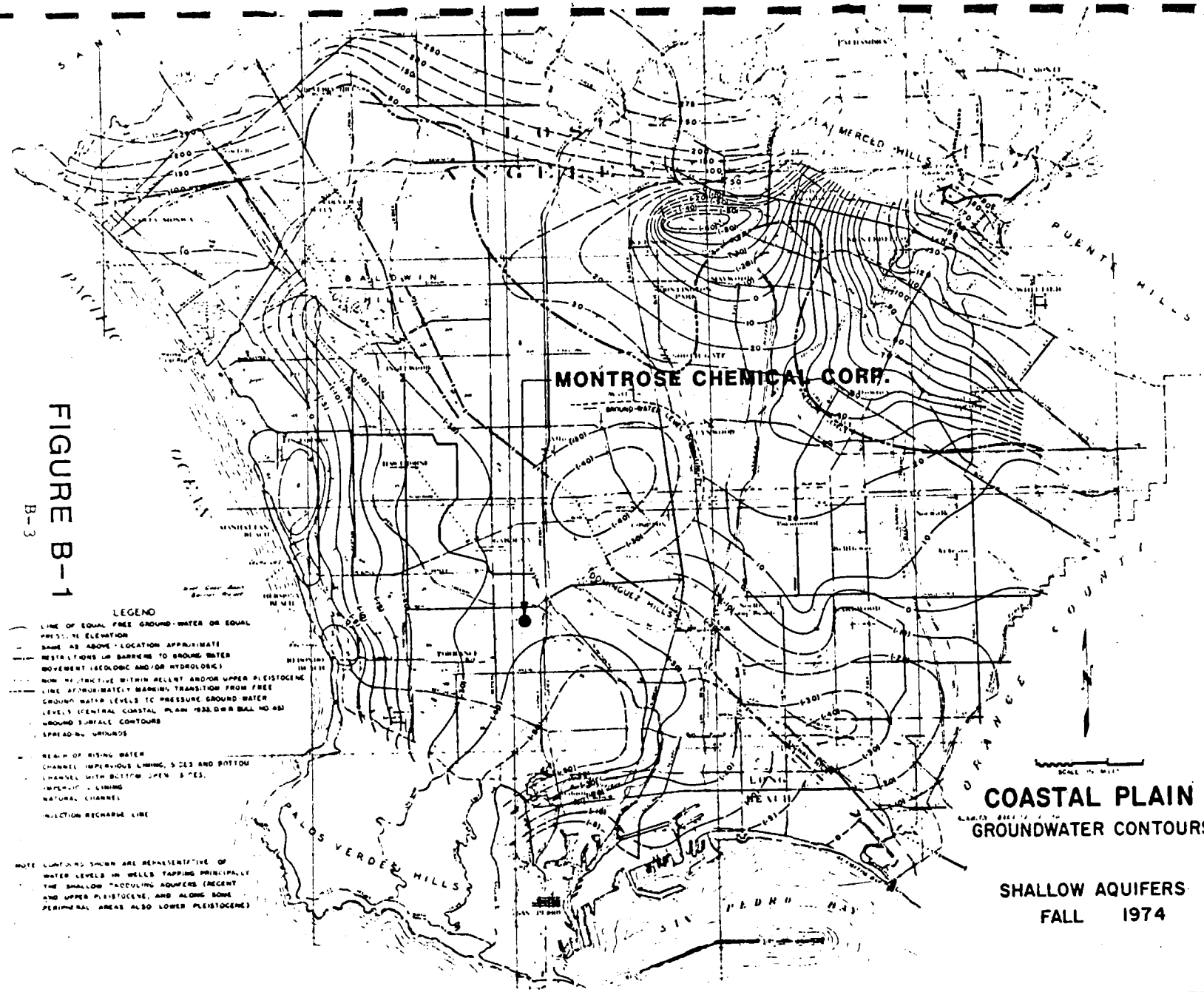
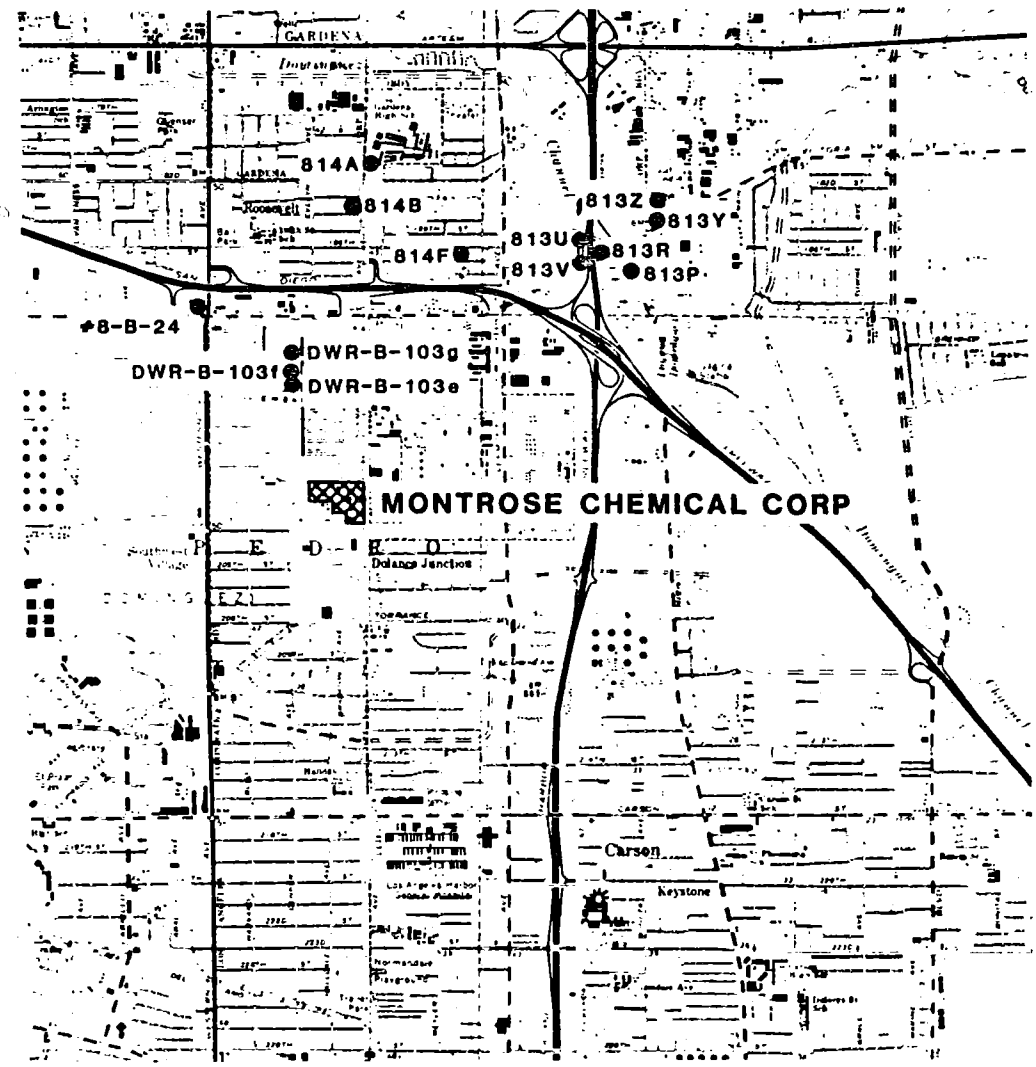


FIGURE B-1

B-3



APPROX SCALE 1"= 3125'

FIGURE B-2. WELL LOCATIONS

GROUNDWATER ELEVATIONS - SELECTED MONITORING WELLS
from Los Angeles County Flood Control District

LACFCD LOC. NUMBER	MO-DA-YR	N M	WATER SURF. ELEV.	Q M	REF. POINT TO MS	REF. POINT ELEV.	GRND. SURF. TO MS	GRND. SURF. ELEV.	Q B S
813 T	3 30 71		-3.0			25.0	28.0	25.0	1
	10 19 71		-3.2				28.2		1
	4 4 72	7							1
	10 17 72	7							1
	4 5 73	7							1
	10 23 73	7							1
	4 3 74	7							1
	10 30 74	7							1
	4 9 75	7							1
	4 22 76	7							1
813 Z	10 27 67		-4.1		30.1	26.0	29.1	25.0	1
	4 8 68		-1.7		27.7		26.7		1
	10 17 68		-7.5		33.5		32.5		1
	4 1 69		6.1		19.9		18.9		1
	10 22 69		-3.0		29.0		28.0		1
	3 31 70		-4.0		30.0		29.0		1
	10 27 70		-4.6		30.6		29.6		1
	3 30 71		-0.1		26.1		25.1		1
	10 19 71		0.1				24.9		1
	4 4 72		-5.1				30.1		1
	10 17 72		-5.9				30.9		1
	4 5 73		-0.1				25.1		1
814 A	10 27 64		-28.4			24.5	50.6	22.0	1
	11 30 64		-29.0		51.0	3022.0	51.0		1
	4 1 65		-29.4			24.5	51.4		3
	4 21 65	2							1
	5 14 65		-29.3		51.3	3022.0	51.3		1
	3 30 66		-29.4			24.5	51.4		3
	10 18 66		-30.2				52.2		1
	3 31 67		-29.6				51.6		1
	10 17 67		-30.6				52.6		1
	10 17 67		-30.6				52.6		1
	4 3 68		-29.2				51.2		1
	4 3 68		-29.2				51.2		1
	10 15 68		-28.5				50.5		1
	4 2 69		-27.1				49.1		1
	4 2 69		-27.1				49.1		1
	10 23 69		-28.2				50.2		1
	4 2 70		-27.2				49.2		1
	10 27 70		-27.7				49.7		1
	4 1 71		-27.2				49.2		1
	10 20 71		-27.9				49.9		1
	4 4 72	7							1
	10 18 72	7							1
	4 6 73	7							1
814 E	11 30 64		6.0		4.7	10.7	5.6	5.6	1
	4 21 65	6							1
814 J	11 30 64		-6.3		27.2	20.9	27.3	17.1	1
	4 21 65	6							1
814 J	11 30 64	6				15.9		12.0	1
815 Y	11 1 64		-0.7			25.0	25.7	25.0	1
	3 26 65		-0.6				25.6		1
	10 25 65		-1.7						1
	3 29 66		2.9			25.0	22.1	25.0	1
	10 17 66		-1.9				26.9		1
	3 29 67		-0.1				25.1		3
	10 19 67		-2.6				27.6		1
	10 19 67		-2.6				27.6		1
	4 4 68		-4.3				29.3		1
	4 4 68		-4.3				29.3		1
	10 17 68		-5.9				30.9		1
	4 1 69		4.2				20.8		1
	4 1 69		4.2				21.8		1
	10 22 69	7							1
	3 31 70		-4.2				29.2		1
	10 27 70		-5.5				30.5		1

FORM 100 REV. 6-49 SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION
WELL DATA

Owner: L.A.C.F.C.D. - Test-hole

Location and Description: 300' S of ℄ of Victoria St.
236' W. of ℄ of Figueroa St.
10' W. of toe of sump levee

Use: Measure and Sample

Elev. of average grd. at well: 25 U. S. G. S. Datum

Elev. of grd. adjacent to well: U. S. G. S. Datum

Water surface reference points:

(a) From 7-1-52 To Elev. Est 21.0 How det. Topo
Description: Top of capped 2" pipe, Est 4' below average ground surface

(b) From To Elev. How det.
Description:

(c) From To Elev. How det.
Description:

(d) From To Elev. How det.
Description:

Type of well: Test-hole Size 2"

Original depth: 20 1/2 Soundings: Sounded Well 20.4 3-2-54
20.25 4-21-60 after Jetting

Pumping equipment:

Power used:

Capacity: Drawdown:

Date drilled: 7-1-52 By LACFCD

Artesian characteristics:

Quality of water:

Remarks: Pipe painted white, extends 4½' above ground surface in sump and Est 4' below the natural surrounding ground surface

(over)

Well Numbers: 1126

Owner

D.W.R. 3S/13W-31Q3

D.W.R.

F.C. 818

1127

LOG OF WELL NO. B13P

FROM	TO	CLASSIFICATION OF MATERIALS	FROM	TO	CLASSIFICATION OF MATERIAL
0	1	Dry black adobe soil			
1	3	Dry brown clay			
3	10	Moist brown clay			
10	11	Very moist brown clay			
11		Struck water			
11	15	Water - Brown clay			

Perforations Screened well point - gravel packed.

Struck water at 11.0'

Water level before perf. _____ after perf. _____

Remarks _____

(over)

FORM No. 100 REV. 8-49 SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION
WELL DATA

Well Number 1128 R

Owner: L.A.C.F.C.D. - Dominguez Channel

Location and Description: 30' N. of N. Side of Victoria St. (190th) - W. Side of Dominguez Channel, at toe of Dump. 100' E of Freeway

Use: Soil Samples and Water Quality Tests G.W. Observation. Destroyed - 4-21-65

Elev. of average grd. at well: _____ U. S. G. S. Datum

Elev. of grd. adjacent to well: 8.1' 9.6 U. S. G. S. Datum

Water surface reference points:

(a) From 9-4-53 To _____ Elev. 8.1 9.6 How det. Rel. to R.P.(b)
Description: Ground surface at well

(b) From 9-18-53 To _____ Elev. 10.9 ~~12.4~~ How det. ~~District~~ Level 3-12-30-63
Description: Top of 2" pipe, 2.8' above ground

(c) From _____ To _____ Elev. _____ How det. _____
Description: _____

(d) From _____ To _____ Elev. _____ How det. _____
Description: _____

Type of well: 6" Hand auger drilled Size 2" I.P.

Original depth: 22.0' Soundings: 24.3-9-2-54
23.66-3-21-60

Pumping equipment: None

Power used: _____

Capacity: _____ Drawdown: _____

Date drilled: 9-4-53 By (O & M Crew) L.A.C.F.C.D.

Artesian characteristics: _____

Quality of water: Somewhat Salty to taste

Remarks: _____

(over)

Upper Estuary Lab T.H. #3

U.S.W.R. 3S/13W-31P1 No.

B.W.R. Loc.

Y.C. 8/13 T.

LOG OF WELL NO. 813R

FROM	TO	CLASSIFICATION OF MATERIALS	FROM	TO	CLASSIFICATION OF MATERIAL
0	1	Top soil - sandy clay			
1	4	Drk. brn. blk organic clay			
4	5	Drk organic silty clay			
5	7.5	Drk. brn clayey silt			
7.5	8.5	Blk. to Brn. silty clay			
8.5	10.6	Drk. brn. silty clay - somewhat saline			
10.6	12.0	Grey green silty fine sand with fossil shells			
12.0	22.0	Similar - more blocish			

Perforations Well point - ?

Struck water at 10.6'

Water level before perf. _____ after perf. _____

Remarks Water sample sent to lab.

(over)

SHEET

Form 100 REV 11-53

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

HYDRAULIC DIVISION

WELL DATA

Well Number: 1130 / TD#25

Owner: L.A.C.F.C.D. - Dominguez

Location and Description: 150' NW of ℄ of 190th St; 5' E. of W. R/W Line of Dominguez Channel. - 130' NW OF NW SIDE OF VICTORIA ST; WEST SIDE OF DOMINGUEZ CHAN. AT TOE OF DUMP 100'± N. OF WELL 813R, 100' E. of Freeway

Use: Geologic & G.W. Observation
Destroyed 4-21-69

Elev. of average grd. at well: U. S. G. S. Datum

Elev. of grd. adjacent to well: 12.0± U. S. G. S. Datum

Water surface reference points:

(a) From To Elev. 15.9' How det. Topo.
Description: Top of 2" pipe, 3.9' above ground

(b) From To Elev. How det.
Description:

(c) From To Elev. How det.
Description:

(d) From To Elev. How det.
Description:

Type of well: Size 2"

Original depth: 75.7' Soundings: 79.4' - 3/2/54

Pumping equipment: None

Power used:

Capacity: Drawdown:

Date drilled: 2-26-54 By LACFCD - O and M Division

Artesian characteristics:

Quality of water:

Remarks:
DATA FROM FIELD 3/2/54

(over)

No. Loc. F.C. 813V

LOG OF WELL NO. 813V

FROM	TO	CLASSIFICATION OF MATERIALS	FROM	TO	CLASSIFICATION OF MATERIALS
0	5	Dump debris			
5	14	Medium bluish brown slightly silty clay and plant remains			
14	16	Dark blue clay - H_2S odor			
16	17.5	Dark blue gray clayey silt			
17.5	20.5	Medium greenish gray clay, plant remains and packets of gypsum			
20.5	24	Dark blue gray fine to medium sand and plant remains			
24	31	Dark blue gray clayey silt			
31	38.5	Medium gray brown to brown gray fine sand			
38.5	40	Medium sand and shells			
40	50	Medium brown gray very fine to fine sand			
50	60	Medium brown medium sand			
60	65	Medium brown silty very fine to fine sand			
65	75.7	Medium brown fine sand			
	16 ?				
	? ?				

Perforations 3' well point, gravel packed to 68'

Struck water at

Water level before perf. after perf.

Remarks

(over)

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION
WELL DATA

Owner: L.A.C.F.C.D. - Test-hole

Location and Description: 132' E. of E of Moneta St.
38' S. of Gov. S. Fence Line
38' S. of N. Edge of Knox St. Ex.

Use: Measure & Sample destroyed 5-1-52

Elev. of average grd. at well: 24 U. S. G. S. Datum

Elev. of grd. adjacent to well: U. S. G. S. Datum

Water surface reference points:

(a) From 7-1-52 To Elev. Est. 19.5' How det. Topo
Description: Top of capped 2" pipe, Est 4½' below average ground surface

(b) From To Elev. How det.
Description:

(c) From To Elev. How det.
Description:

(d) From To Elev. How det.
Description:

Type of well: Test-hole Size 2"

Original depth: 28.5 Soundings: 28.40 3/2/54

Pumping equipment:

Power used:

Capacity: Drawdown:

Date drilled: 6-30-52 By L.A.C.F.C.D.

Artesian characteristics:

Quality of water:

Remarks: South of Gov. filter plant, near junction of Harbor Blvd. & Moneta St. Pipe, painted white, extends 5' above ground surface in sump and 9½' below the natural surrounding ground surface.

(over)

Well Number
Owner
D.W.R. No.
Loc.
H.W.R.
F.C. 8142

1132.2

LOG OF WELL NO. 814B

FROM	TO	CLASSIFICATION OF MATERIALS	FROM	TO	CLASSIFICATION OF MATERIAL
0	3	Dry black adobe			
3	10	Slightly moist black adobe			
10	12	Moist sandy brown clay			
12	15	Moist brown clay			
15	16	50% sand - 50% Brown clay			
16	21	Moist clay and some fine sand			
21	23	Moist sand - bottom of well - caving in discontinued drilling			

Perforations Screened well point - gravel packed

Struck water at 2'

Static water level before perf. after perf.

Remarks

(over)

7WR348 100 REV. C&b 10-57 SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION
WELL DATA

Owner: L.A.C.F.C.D.

Location and Description: 184' E. of E. Manela Ave.; 33' So. of E. Knox Ave. prod. E.; 53' So. of U.S. Govt. Fence; (at extreme west end of sump in bottom of sump.)

Use: Test Hole

Elev. of average grd. at well: _____ U. S. G. S. Datum

Elev. of grd. adjacent to well: _____ U. S. G. S. Datum

Water surface reference points:

(a) From 6-19-58 To _____ Elev. _____ How det. _____
Description: Top of capped 2" meas. pipe, 4.0' above adjacent ground (bottom of sump)

(b) From _____ To _____ Elev. _____ How det. _____
Description: _____

(c) From _____ To _____ Elev. _____ How det. _____
Description: _____

(d) From _____ To _____ Elev. _____ How det. _____
Description: _____

Type of well: Hand Auger Size 2"

Original depth: 19.5' Soundings: 23.9-6-18-58
23.25-3-22-60

Pumping equipment: none

Power used: _____

Capacity: _____ Drawdown: _____

Date drilled: 6-19-58 By L.A.C.F.C.D.

Artesian characteristics: _____

Quality of water: _____

Remarks: Replaces T.H. 814B (Destroyed) data from Field WBV. 6-19-58

(over)

Well Numbers
Old No.
No.
Loc.
F.C. 814F

LOG OF WELL NO. 814F

FROM	TO	CLASSIFICATION OF MATERIALS	FROM	TO	CLASSIFICATION OF MATERIALS
0	5	silty clay			
5	7	greenish-gray clay, with orange stains.			
7	8	black sandy clay, organic			
8	9	fine sandy to silty clay, dk gray			
9	11.5	greenish gray clay			
11.5	13	fine sandy clay, greenish gray, orange stains & scattered wood chips			
13	14	fine sandy silty clay, orange			
14	15	med fine clayey sand, orange			
15	15.5	" " sandy clay, lt gray			
15.5	16	fine sandy clay, lt gray			
16	16.5	" very fine, sand silty, lt olive gray			
16.5	19	med fine sand, lt greenish gray, wet @ 19'			
19	19.5	med sand, lt gray wet,			

Perforations 3' well point

Struck water at 19.3'

Water level before perf. _____ after perf. _____

Remarks _____

(over)

WELL LOG

DEPARTMENT OF WATER & POWER
OF
THE CITY OF LOS ANGELES

794C

DWR-B-10389

Well Number or Name Aluminum Co. of America No. 1

LOCATION 190th & Normandie, Los Angeles
1247' W. of Normandie Ave., 803' S. of 190th St. MAP No.

WORK STARTED 7-31-42 WORK COMPLETED 8-29-42

600 ft. of 14 in. 10 ga./ga. casing was left in well
" " " " " " " " "
" " " " " " " " "
" " " " " " " " "

Type of perforator used Hydraulic

Perforated 550 ft. to 538 ft. 8 holes per 4" ft.
" 516 " 478 " 8 " " 4"
" 433 " 427 " 8 " " 4"
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "

Diameter of perforations 5/16 in., length 1-3/4 in.
Depth at which water was first found 76 ft.
Standing level before perforating 76 ft.
Standing level after perforating 83 ft.
Note your observation of any change in water level while drilling

Date tested 19
Water level when first started test 83 ft.
Draw down from standing level ft.
G. P. M. at beginning of test
G. P. M. at completion of test 1375
Draw down at completion of test 33 ft.
If reducing strings of casing were cut off, state how cut

Depth from surface cut ft.
Size of casing cut in.
Lap in larger casing ft.
Was adapter or cement used?
If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight top to bottom, if not, what is the variation?
Pactically

Will there be any detrimental effect on pump, and if so, what?
None

Give any additional data which may be of future value:
Cement plug installed to 596'

Total depth of well 600 ft.

Formation: Mention size of water gravel—

0	ft. to 3	ft.	Topsoil
3	" 68	"	Clay
68	" 118	"	Sandy clay - soft streaks
118	" 122	"	Fine brown sand
122	" 134	"	Brown sandy clay
134	" 153	"	Blue clay - streaks sand
153	" 187	"	Fine blue sand
187	" 214	"	Blue sandy clay
214	" 316	"	Blue clay
316	" 324	"	Blue clay - 1/4" embedded gravel
324	" 330	"	Blue clay
330	" 333	"	Blue clay - 1/4" embedded gravel
333	" 418	"	Blue clay
418	" 424	"	Fine muddy sand, some 1/4" to 1/2" gravel
424	" 432	"	Fine sand and clay
432	" 437	"	" " " "
437	" 460	"	Fine sandy clay
460	" 470	"	Fine sand and clay
470	" 474	"	Blue clay
474	" 482	"	Sand and gravel to 1"
482	" 495	"	" " " to 3/4"
495	" 515	"	" " " to 2"
515	" 519	"	" " " " 1/2"
519	" 536	"	Fine sand and clay
536	" 547	"	Sand and gravel to 1"
547	" 573	"	Fine sandy clay
573	" 600	"	Blue clay

Date of Report Sept. 2, 1942
Roscoe Moss Co.
Driller
In charge W. Peterson

SHOW LOCATION ON BACK B-16

WELL LOG

DEPARTMENT OF WATER & POWER
OF
THE CITY OF LOS ANGELES

794-B
DWR - B-103f

Well Number or Name Aluminum Co. of America No. 2

LOCATION 190th & Normandie Streets, Los Angeles
1220 W. of Normandie Ave., 1169 S. of 190th St. MAP No.

WORK STARTED 8-31-42 WORK COMPLETED 9-17-42

600 ft. of 14 in. 10 #/ga. casing was left in well
" " " " " " " " "
" " " " " " " " "
" " " " " " " " "

Type of perforator used Hydraulic

Perforated 540 ft. to 535 ft. 8 holes per ft. 4"
" 530 " 525 " 8 " " "
" 506 " 477 " 8 " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "
" " " " " " " "

Diameter of perforations 5/16 in., length 1-3/4 in.
Depth at which water was first found 67 ft.
Standing level before perforating 64 to 79 ft.
Standing level after perforating 83 ft.
Note your observation of any change in water level while drilling

Date tested 19
Water level when first started test 83 ft.
Draw down from standing level ft.
G. P. M. at beginning of test
G. P. M. at completion of test 810
Draw down at completion of test 29 ft.
If reducing strings of casing were cut off, state how cut

Depth from surface cut ft.
Size of casing cut in.
Lap in larger casing ft.
Was adapter or cement used?
If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight top to bottom, if not, what is the variation?
Practically straight
Will there be any detrimental effect on pump, and if so, what?
None
Give any additional data which may be of future value:

Total depth of well 600 ft.

Formation: Mention size of water gravel—

0	ft. to	65	ft.	Sandy clay
65	"	157	"	Sandy clay - soft streaks
157	"	185	"	Fine sand
185	"	212	"	Blue sand and clay
212	"	420	"	Blue clay
420	"	428	"	Fine sand to 3/4" gravel
428	"	434	"	Blue sand and clay
434	"	456	"	Blue clay
456	"	462	"	Fine sand and clay
462	"	475	"	Blue clay
475	"	482	"	Sand and gravel to 1"
482	"	486	"	Clay and gravel
486	"	504	"	Sand and gravel to 2"
504	"	522	"	Sand and clay
522	"	528	"	Sand to 3/4" gravel
528	"	533	"	Fine sand, some gravel
533	"	538	"	Sand and gravel to 3/4"
538	"	545	"	Sand and clay
545	"	600	"	Sandy clay

Date of Report 9-21 , 1942
Roscoe Moss Co.
Driller
In charge W. Peterson

SHOW LOCATION ON BACK B-17

WELL LOG

DEPARTMENT OF WATER & POWER
OF
THE CITY OF LOS ANGELES

794-A

DRW - B-103e

Well Number or Name Aluminum Co. of America No. 3

LOCATION 190th & Normandie Streets
1220' W. of Normandie Ave. - 1369' S. of 190th St. MAP No.

WORK STARTED 9-18-42 WORK COMPLETED 10-9-42

600 ft. of 14 in. 10 lb./ga. casing was left in well
" " " " " " " "
" " " " " " " "
" " " " " " " "

Type of perforator used Hydraulic

Perforated 514 ft. to 473 ft. 8 holes per ft.
" " " " " " "
" " " " " " "
" " " " " " "
" " " " " " "
" " " " " " "
" " " " " " "
" " " " " " "
" " " " " " "
" " " " " " "

Diameter of perforations 5/16 in., length in.

Depth at which water was first found 68 ft.

Standing level before perforating 69 to 80 ft.

Standing level after perforatung 83 ft.

Note your observation of any change in water level while drilling

Date tested , 19

Water level when first started test 83 ft.

Draw down from standing level ft.

G. P. M. at beginning of test

G. P. M. at completion of test 815

Draw down at completion of test 33 ft.

If reducing strings of casing were cut off, state how cut

Depth from surface cut ft.

Size of casing cut in.

Lap in larger casing ft.

Was adapter or cement used?

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Is well straight top to bottom, if not, what is the variation?
Practically straight

Will there be any detrimental effect on pump, and if so, what?
None

Give any additional data which may be of future value:

Total depth of well 600 ft.

Formation: Mention size of water gravel—

0	ft. to 154	ft.	Sandy clay, soft streaks
154	" 182	"	Fine sand
182	" 210	"	Blue sand and clay
210	" 290	"	Blue clay
290	" 292	"	Sand and gravel to 3/4"
292	" 420	"	Blue sandy clay
420	" 458	"	Clay
458	" 466	"	Fine to coarse sand
466	" 470	"	Blue clay
470	" 480	"	Sand to 1-1/2" gravel
480	" 490	"	Clay, sand and gravel
490	" 502	"	Sand gravel to 3"
502	" 512	"	Sand to 3/4" gravel
512	" 536	"	Sandy clay, some gravel
536	" 600	"	Fine sand and clay

Date of Report 10-14 , 19 42

Roscoe Moss Co.
Driller

In charge W. Peterson

SHOW LOCATION ON BACK B-18

WELL LOG

#8-S-24 DEPARTMENT OF WATER & POWER #8-B-24

CITY OF LOS ANGELES

Well Number or Name Southern Calif. Edison Co.

LOCATION N.W. cor. 190th St. and Western Ave. South Coast Dist. MAP No.

WORK STARTED ..... WORK COMPLETED 5-16-19

..... ft. of 12 in. ..... lb./ga. casing ..... left in well

..... " ..... " ..... " " ..... " " "

..... " ..... " ..... " " ..... " " "

..... " ..... " ..... " " ..... " " "

Type of perforator used .....

Perforated ..... ft. to ..... ft. ..... holes per ft.

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

" ..... " ..... " ..... " " "

Diameter of perforations ..... in., length ..... in.

Depth at which water was first found ..... ft.

Standing level before perforating ..... ft.

Standing level after perforating ..... ft.

Note your observation of any change in water level while drilling.

.....

.....

Date tested ....., 19.....

Water level when first started test ..... ft.

Draw down from standing level ..... ft.

G. P. M. at beginning of test .....

G. P. M. at completion of test .....

Draw down at completion of test ..... ft.

If reducing strings of casing were cut off, state how cut .....

.....

Depth from surface cut ..... ft.

Size of casing cut ..... in.

Lap in larger casing ..... ft.

Was adapter or cement used? .....

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

.....

.....

Is well straight top to bottom, if not, what is the variation?

.....

Will there be any detrimental effect on pump, and if so, what?

.....

Give any additional data which may be of future value: .....

.....

Total depth of well 550 ft.

Formation: Mention size of water gravel—

0	ft. to	14 ft.	Soil
14	"	61	" Clay
61	"	71	" Sand
71	"	75	" Clay
75	"	195	" Sand
195	"	307	" Clay
307	"	313	" Sand
313	"	335	" Clay
335	"	341	" Fine gravel
341	"	441	" Clay
441	"	459	" Sand
459	"	470	" Packed sand
470	"	485	" Fine gravel - cut
485	"	522	" Sand
522	"	528	" Fine gravel - cut
528	"	543	" Sand
543	"	548	" Fine gravel
548	"	550	" Soft clay

Plugged 3' redwood and 3' rock

Date of Report ....., 19.....

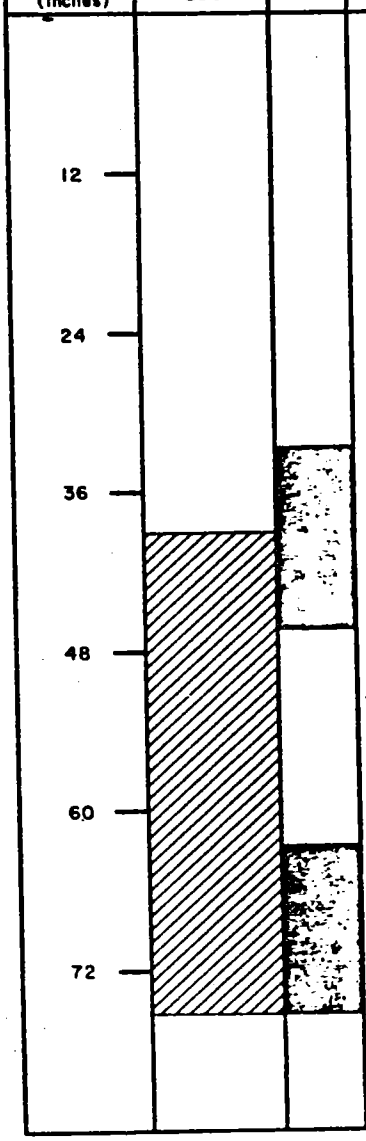
Tompkins
Driller

SHOW LOCATION ON BACK B-19

LITHOLOGIC LOG OF TEST HOLE S-4A

TEST HOLE DEPTH: 75 inches
TEST HOLE DIAMETER: 20 inches
DRILLING METHOD: Bucket Auger

DATE DRILLED: 8-10-83
DRILLED BY: A & W Drill Rentals, Inc.
LOGGED BY: C. Dickens and S. Clark



DESCRIPTION OF MATERIALS	
FILL:	Sandy clay with pieces of brick, concrete, and gravel; slightly moist.
	Black granular material in the depth interval 18-30 inches.
SANDY CLAY:	Brown to dark brown; moist, firm.

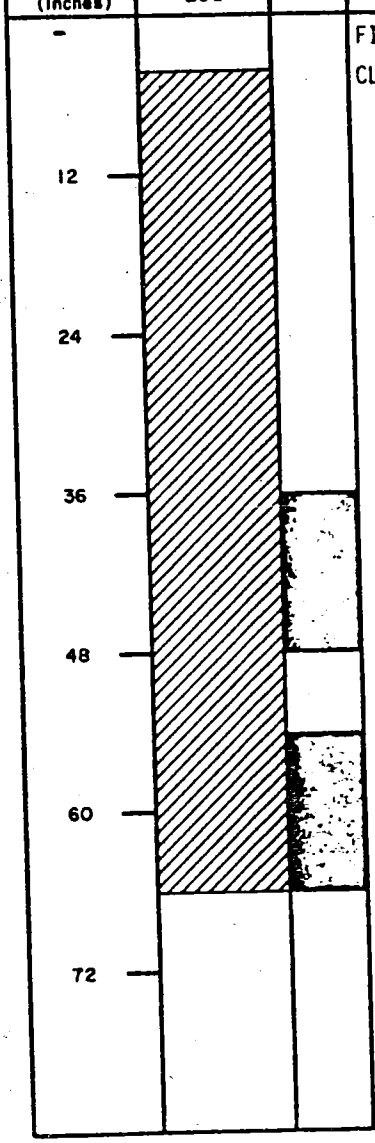
REMARKS: Both samples collected using a split-spoon.

HARGIS & MONTGOMERY, INC.
TUCSON, ARIZONA

LITHOLOGIC LOG OF TEST HOLE S-5A

TEST HOLE DEPTH: 66 inches
TEST HOLE DIAMETER: 20 inches
DRILLING METHOD: Bucket Auger

DATE DRILLED: 8-9-83
DRILLED BY: A & W Drill Rentals, Inc.
LOGGED BY: S. Clark



DESCRIPTION OF MATERIALS	
FILL:	Gravelly sand, dry, loose.
CLAY/ SANDY CLAY:	Dark brown; moist, firm, cohesive.
	At 54 inches, grading sandier with localized white streaks.

REMARKS: Both samples collected using a split-spoon.

HARGIS & MONTGOMERY, INC.
TUCSON, ARIZONA

REFERENCES

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2. Telephone Communication. Flood Hazard Section, Los Angeles County Flood Control District. Don Keene and Bill Temple. September 1983.

3. Telephone Communication. Los Angeles Department of Water and Power. Tom Turner and Bob Haw. September 1983.

4. Telephone Communication. Torrance Water Department. Mr. Hyster. September 1983.

5. California Department of Water Resources. Bulletin No. 104. Planned Utilization of the Groundwater Basins of the Coastal Plain of Los Angeles County. Appendix A. Geology. 1961.

6. Poland, J.F., et al. Geology, Hydrology, and Chemical Character of Ground Waters in the Torrance-Santa Monica Area, California. USGS Water-Supply Paper No. 1461. 1959.

7. Poland, J.F., et al. Ground-water Geology of the Coastal Zone Long Beach - Santa Ana Area, California. USGS WSP 1109. 1956.

8. Sinnott, A. and J.F. Poland. Hydrology of the Long Beach - Santa Ana Area, California. USGS WSP 1471. 1959.

9. Los Angeles Regional Water Quality Control Board. Water Quality Control Plan Report: Los Angeles River Basin (4B). Volume I, Part II. 1975.

Appendix C

BACKGROUND
DDT CONCENTRATIONS

COUNTY OF LOS ANGELES • DEPARTMENT OF HEALTH SERVICES

313 NORTH FIGUEROA STREET • LOS ANGELES, CALIFORNIA 90012 • (213) 974-8101

August 1, 1983

TO: Kenneth Hahn, Supervisor
Second Supervisorial District

FROM: Robert W. White
Director of Health Services

SUBJECT: CADILLAC-FAIRVIEW HAZARDOUS WASTE SITE, TORRANCE

In response to your Board Motion of July 14, 1983, we have provided several progress memos regarding actions being taken toward cleanup of the Cadillac-Fairview hazardous waste site.

We collected surface and core soil samples from a number of locations in the vicinity and water samples from area residents and from the Dominguez Water Company, Well #19. These samples have now been analyzed. The water samples show a "non-detectible level" for the expected chemicals in each case. The soils analysis also indicate that the vast majority of results for the various metals are within recommended standards. The majority of those results outside recommended standards are barely above and are of no known health significance. Eight samples showed high levels of lead and zinc and these sites will be further investigated to determine a more definitive source for these spot samples.

Also attached are two reports, one dated July 19, 1983 from the Acting State Director of the Department of Health Services Toxic Substances Control Division. This letter to Mr. Ralph Tufenkian reports on the results of State cleanup efforts to date and outlines a plan of action for future efforts.

The second letter dated July 21, 1983, responds to an earlier letter sent by this Department requesting information on planned State use of Superfund money. As you can see, the Cadillac-Fairview site is at the top of the State list and is expected to be allocated $400,000 for development of a cleanup plan.

We will continue to keep you informed of progress on this matter.

RWW:pv
Attachments

C-1

TO	R. L. Dennerline	FROM	Daniel Fresquez

Subject: CADILLAC-FAIRVIEW SAMPLING RESULTS — Date: July 21, 1983 — No.

These are results so far. They are not as clean as we had expected. The items of interest are:

1) DDT) Levels exceed old CAM which is 1 ppm
   DDE)

2) All items with star exceed old CAM. I have to check new CAM.

3) There is an anomoly on zinc at 223rd Street and Halldale which I have retaken, this is a control. There is a high lead at pole #1 at 4" level.

4) In retrospect, I can see that 1237 Electric Street sample (a control) is a little low due to area where it was taken - Hard rain washed soil by side of road, I could not find a good field.

5) 1043½ W. 204th Street came out a little high in metals.

6) I propose to take another control at a more suitable location - both surface and core. The two additional controls for DDT plume were only surface samples.

DF:s

CADILLAC-FAIRVIEW SITE

Soil Tests on Del Amo Blvd.
(Samples taken 15 ft. South of site fence line)[3]

TEST[1]	Telephone Pole #1 Surface	Telephone Pole #1 4" core	Telephone Pole #1 18" core	Telephone Pole #4 Surface	Telephone Pole #4 18" core	Telephone Pole #7 Surface	Telephone Pole #7 18" core	Telephone Pole #10 Surface	Telephone Pole #10 18" core	Telephone Pole #13 Surface	Telephone Pole #13 4" core	Telephone Pole #13 18" core	223rd St. [illegible] Surface	223rd St. [illegible] 18" core	[illegible] Electric [illegible] Surface	[illegible]	[illegible]
PCB (ppm)	ND[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
DDT	3.9	3.7	ND	2.9	ND	1.4	ND	2.5	nd	1.9	1.2	ND	ND	ND	ND	ND	[illegible]
DDE	.95	.50	ND	1.1	ND	.51	ND	.04	ND	.90	.13	ND	ND	ND	ND	ND	[illegible]
DDD	∠1	.90	ND	ND	ND	ND	ND	ND	ND	∠1	ND	ND	ND	ND	ND	ND	ND
Total Chromium	∠10	121	ND	∠10	ND	ND	ND	∠10	ND	∠10	∠10	∠10	ND	ND	ND	ND	ND
Cadmium	∠4	∠4	∠4	∠4	∠4	∠4	∠4	∠4	10	∠4	∠4	∠4	∠4	∠4	∠4	[illegible]	[illegible]
Copper	29	38	10	260	15	36	11	50	14	37	45	16	26	3	8	8	[illegible]
Nickel	12	19	12	22	14	20	12	20	12	20	24	17	8	1	[illegible]	10	10
Lead	106	2100[4] (700)	ND	50	ND	25	ND	50	ND	306	200	ND	87	ND	25	ND	[illegible]
Zinc	77	230	67	170	59	141	41	196	69	215	141	64	[illegible] ([illegible])	[5] 4	[illegible]	44	[illegible]

1. All Data in PPM
2. ND = None Detectable
3. Surface and core sampling
4. Attributed to paint waste in soil
5. Unexplained anomaly
6. ∠ = Less than

C-3

CADILLAC-FAIRVIEW SITE

Soil Tests for Residences Bordering Site On Del Amo Blvd. (South of Site)

Location	1129 W. 204th St. Rear yard	1121 W. 204th St. Rear yard	1033½ W. 204th St. Rear yard	958 Del Amo Blvd. Rear Yard	951 W. 204th St. Rear yard	Control 2 miles north	Control 1.5 miles south	Control [illegible]
TEST 1								
PCB (ppm)	ND	ND	ND	ND	ND	ND	ND	--
DDT	3.0	3.1	2.6	1.7	1.7	ND	ND	.00
DDE	1.7	1.0	1.1	0.40	0.71	ND	ND	.52
DDD	ND	0.23	∠1 ppm	∠1 ppm	∠1 ppm	ND	ND	ND
Total Chromium	ND	ND	33	ND	∠10 ppm	ND	ND	ND
Cadmium	∠4 ppm	∠4 ppm	∠4 ppm	∠4 ppm	6	∠4 ppm	∠4 ppm	ND
Copper	24	31	99	14	43	8	26	24.5
Nickel	17	22	120	3	31	3	8	10
Lead	37	56	156	57	179	25	87	305
Zinc	116	156	212	126	286	54	81[illegible] (86.0)	90

All data in part per million (ppm)
Composite surface soil samples
ND = None detectable
Unexplained anomoly
∠ = less than

CADILLAC FAIRVIEW SITE
Attachment #2

WATER TESTS FOR AREA RESIDENTS AND WELL #19

TEST	9911 W. 204th Street	10434 W204th St.	1121 W. 204th St.	1129 W. 204th St.	958 Del Amo Blvd.	Well #19 [illegible] L. Carson	1118 Alameda Ave. [illegible]
ENZENE	ND	ND	ND	ND	ND	ND	ND
LUENE	ND	ND	ND	ND	ND	ND	ND
HYLBENZENE	ND	ND	ND	ND	ND	ND	ND
TYRENE	ND	ND	ND	ND	ND	ND	ND
UORENE	ND	ND	ND	ND	ND	ND	ND
DT	ND	ND	ND	ND	ND	ND	ND

Taken at residents homes
Untreated water from Well #19.

Appendix D

MONTROSE CHEMICAL CORPORATION
PROPOSED SEALING PLANS

Appendix D

MONTROSE CHEMICAL CORPORATION PROPOSED
SEALING PLANS

Two submissions of Sealing Plans have been made by Montrose Chemical Corp. to EPA and are included in this Appendix. The Intermediate Sealing Plan (p. D-2 and first pocket, sheets 1-3) was delivered to EPA at a meeting August 5, 1983.

The "Torrance Project" plans (second pocket, sheets 1-5) were submitted to EPA on September 21, 1983.

At the meeting on September 30, 1983, Montrose stated that the "V" channel and pipeline to Farmer Brothers Company's catch-basin shown on Sheet 2 of the Intermediate Sealing Plan would be rerouted to discharge directly to the City storm drain, although no written details of this change have been submitted.

Stauffer Chemical Company

Notes Accompanying
Intermediate Sealing Plan

- prepared for Montrose Chemical Corporation of California

2 August 1983
page 1 of 1
T. J. Kent

There are four basic systems used to seal off the surface of this 13+ acre site from rainwater, which also serve to guide the runoff to the southeast corner of the site and thence off the property by means of a gunite-lined drainage channel:

a) a 2" concrete cap over prepared subbase for the westerly 3 or so acres; this area will be dormant and not used for subsequently-planned warehousing or outside storage operations;

b) a 6" layer of compacted, decomposed granite or slag which will remain in place until two warehouse pads of compacted fill are placed on top and this material, in turn, is covered with a 6" thick, wire mesh-reinforced, concrete slab (forming the floor for 2 tilt-up structures);

c) a 2" layer of asphalt over 8" aggregate base for most of the truck driveway and parking areas; the entryway off Normandie is also shown with this cover, but this will eventually be replaced by a reinforced concrete entrance, when the warehouses are built;

d) 2 6" concrete pads over prepared subbase, along the truck access sides of the planned warehouses, to act as water flowline routes and as hardstanding areas for trucks and truck/trailers.

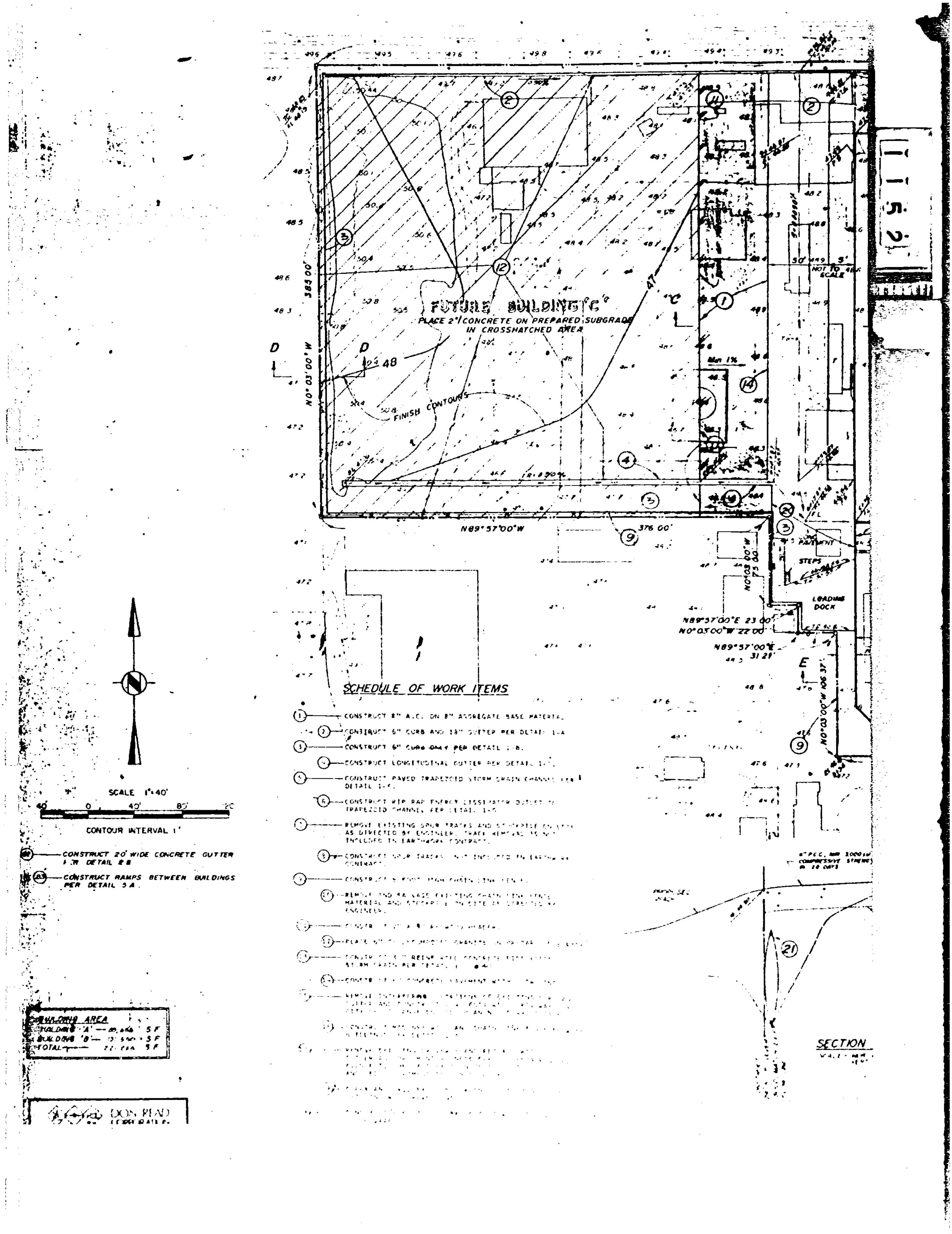
After placement of these sealing systems, during construction of the two warehouses in 1983/84, and thereafter, the integrity of the surface sealing is to be assured by these steps:

1. Stauffer will manage the property itself and excavation for repair or maintenance purposes will only be permitted in the non-rainy season (emergencies excluded) or under protection of temporary roofing for water exclusion.

2. Weekly walk-arounds of the site will be conducted by onsite management, supplemented quarterly by similar inspections by a paving contractor, to spot any potential or emerging surface problems - such as cracks, erosion spots, surface spalling, and the like.

3. Immediate corrective action by a paving contractor, under the terms of a service-type repair and maintenance contract, will be taken for any and all surface problems noted in #2. This is to include asphalt and concrete removal, patching or complete area replacement, as required by the situation.

4. In addition to the above steps, Stauffer will apply at regular intervals a sealing compound to the asphalt surfaces and will monitor the concrete joints to keep down weed growth or to replace the redwood expansion strips and bitumen-type sealer as required.



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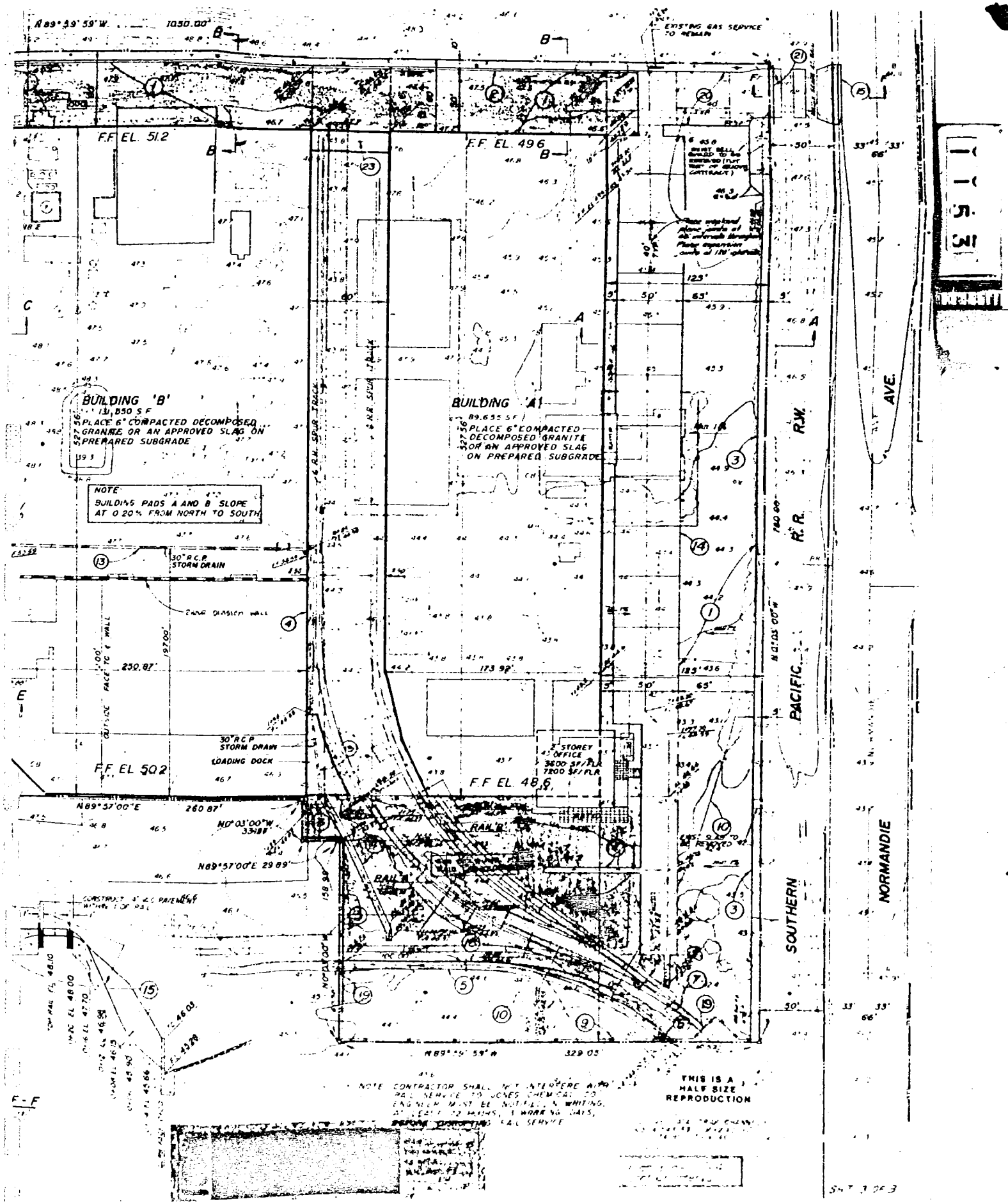
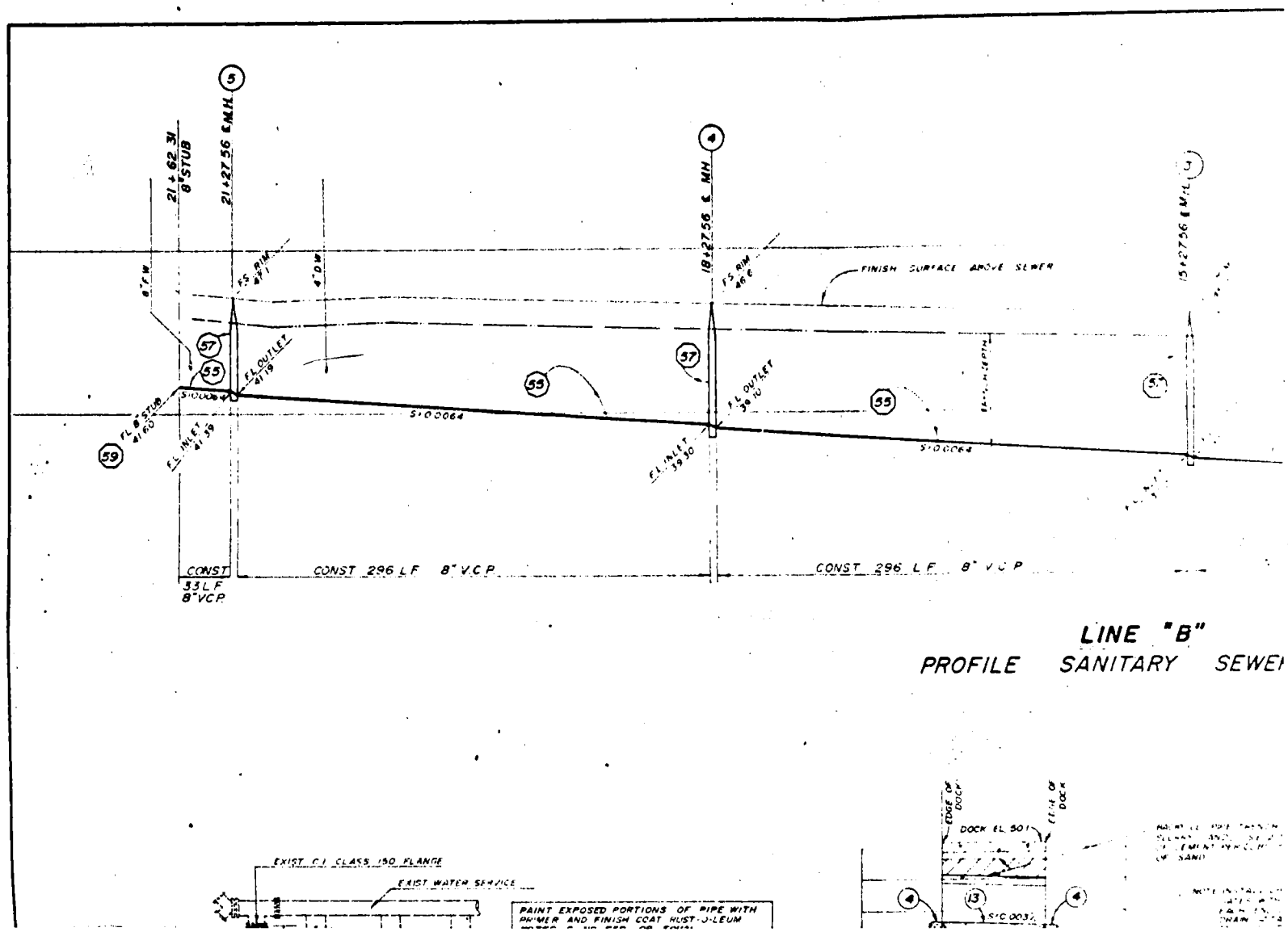
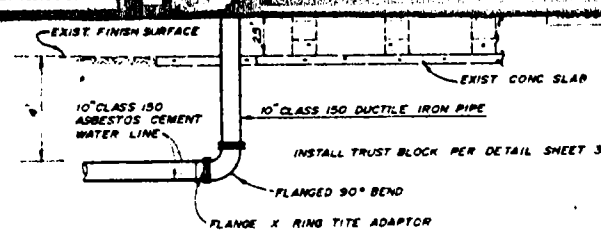


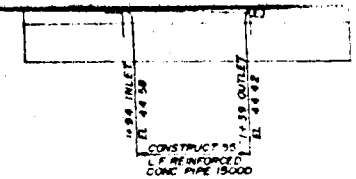
BOE-C6-0176953

1154



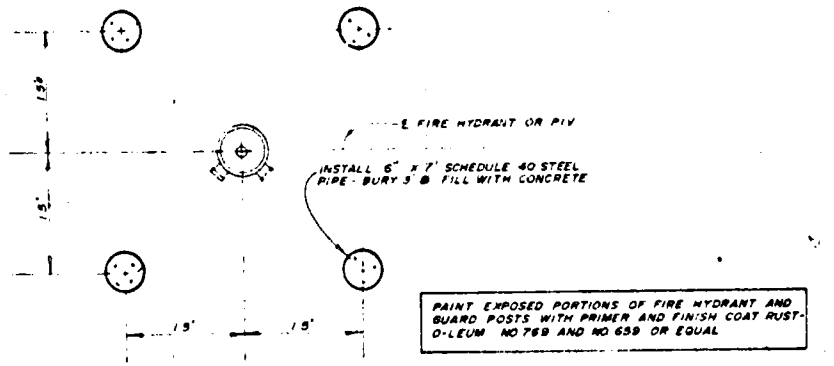


DETAIL (4-A)



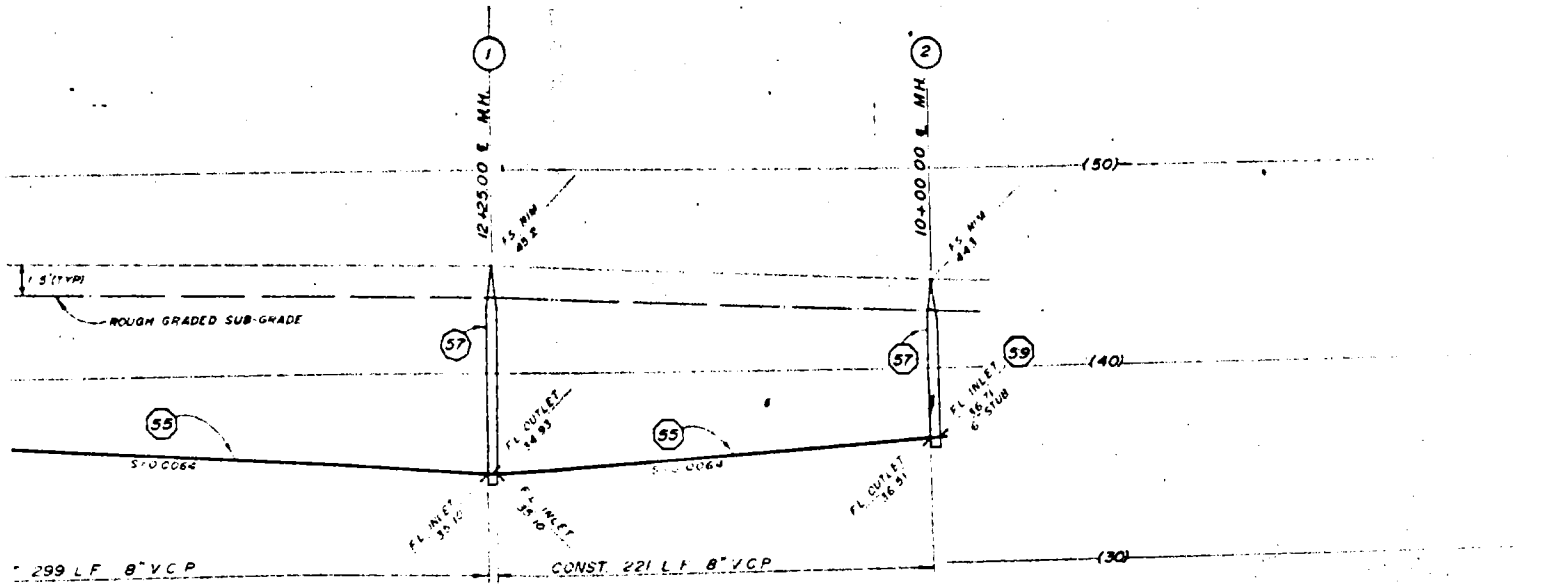
PIPE BEDDING SHALL CONFORM TO L.A.F.C.D. STD. DRAWING 20-17, CASE III, BEDDING B SHALL BE SLURRY SAND AS NOTED ABOVE

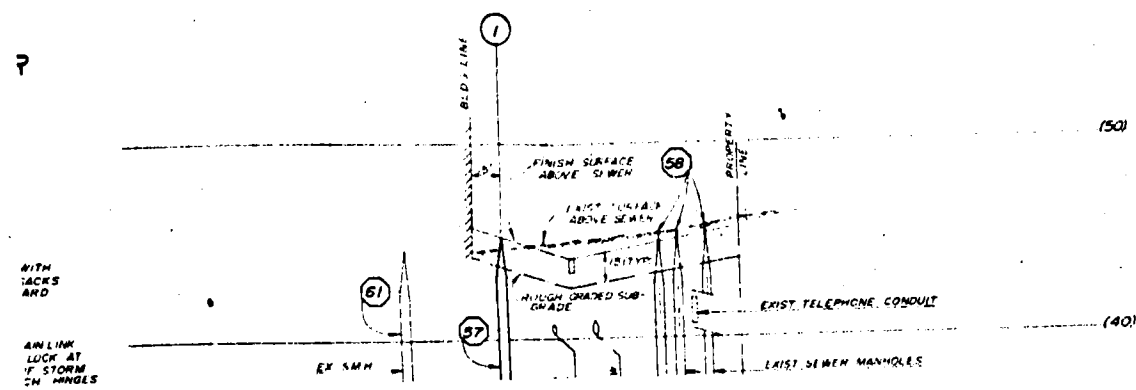
DETAIL (4-C)
CULVERT PROFILE
SCALES HOR. 1"=40'
VERT. 1"=8'



PAINT EXPOSED PORTIONS OF FIRE HYDRANT AND GUARD POSTS WITH PRIMER AND FINISH COAT RUST-O-LEUM NO 769 AND NO 659 OR EQUAL

DETAIL (4-B)
FIRE HYDRANT AND P.I.V. GUARD POSTS
INSTALL GUARD POSTS AROUND ALL FIRE HYDRANTS OR POST INDICATOR VALVES NOT PROTECTED BY CURB





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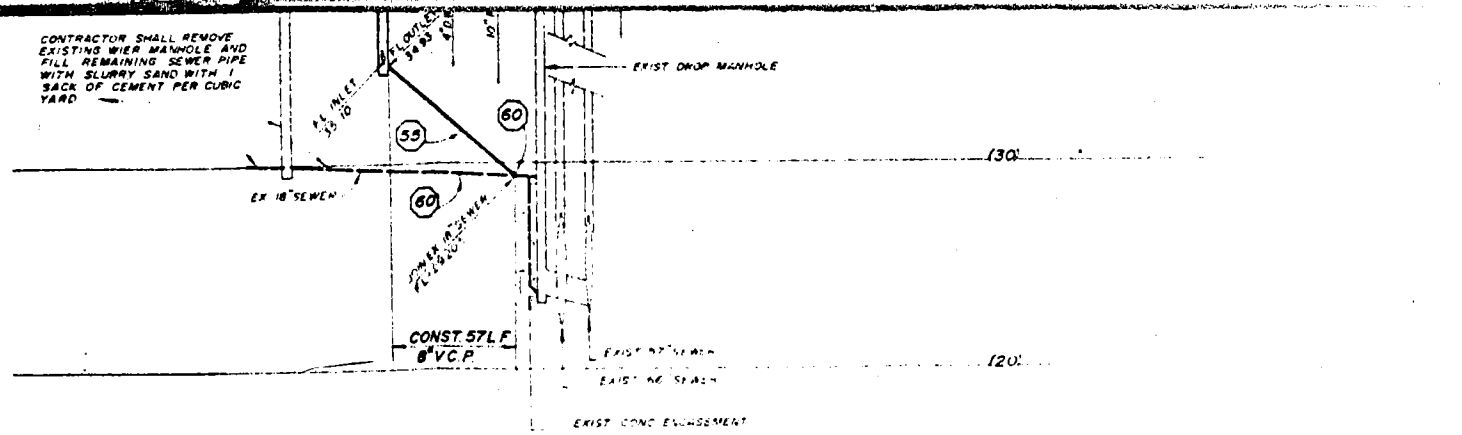


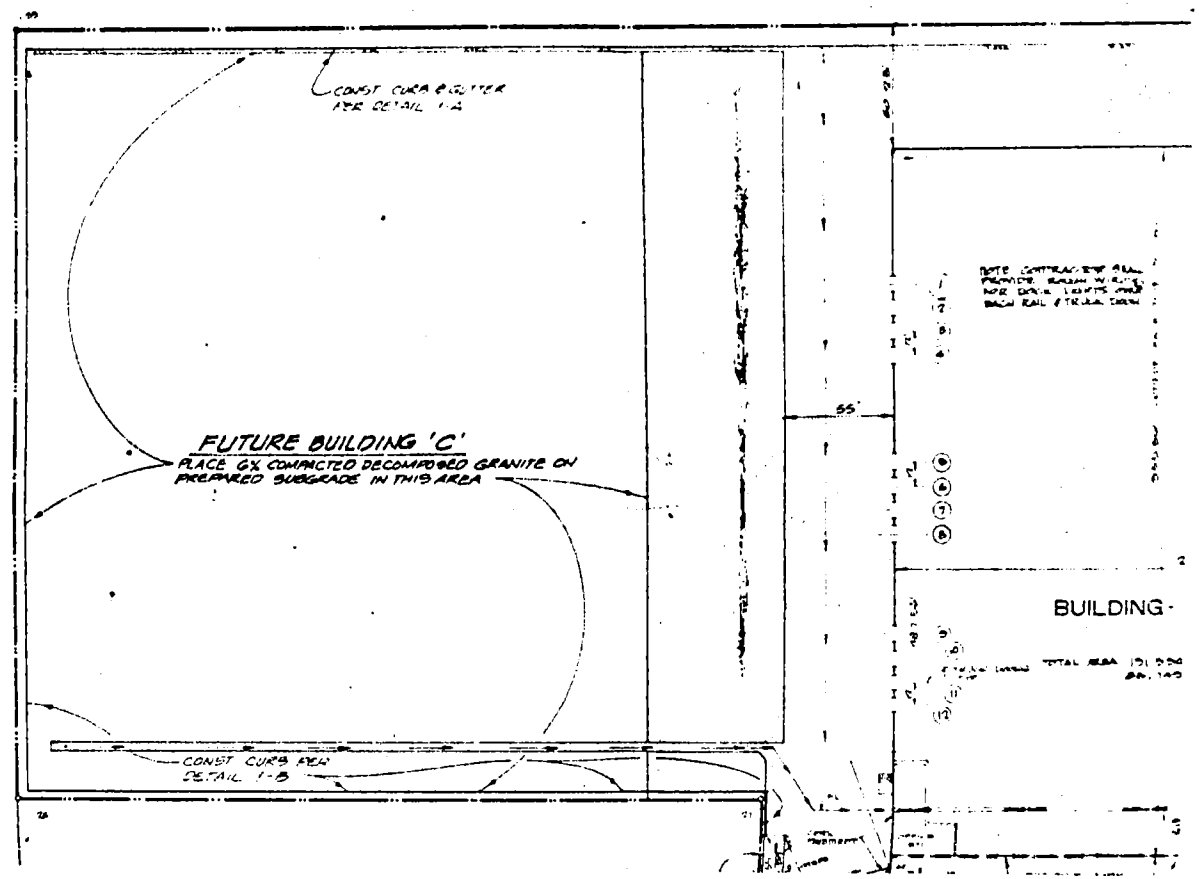
LINE "A"

PROFILE SANITARY SEWER

THIS IS A HALF SIZE REPRODUCTION

SOILS ENGINEER TRIAD FOUNDATION ENGINEERING, INC. 123 E. RAILROAD ST. INDUSTRY, CA 91748 (213) 964-2313	DESIGN ENGINEER O'MALLEY ENGINEERING CO. 419 POMONA ROAD, CORONA, CA 91720 (714) 734-0833 APPROVED JAMES O'MALLEY CE 27017 7-21-83 DATE	OWNER-DEVELOPER STAUFFER CHEMICAL CO 636 CALIFORNIA STREET, SAN FRANCISCO, CA 94108 (415) 366-8000	SEWER PROFILE - DETAILS TORRANCE PROJECT SHEET 4 OF 5

1158



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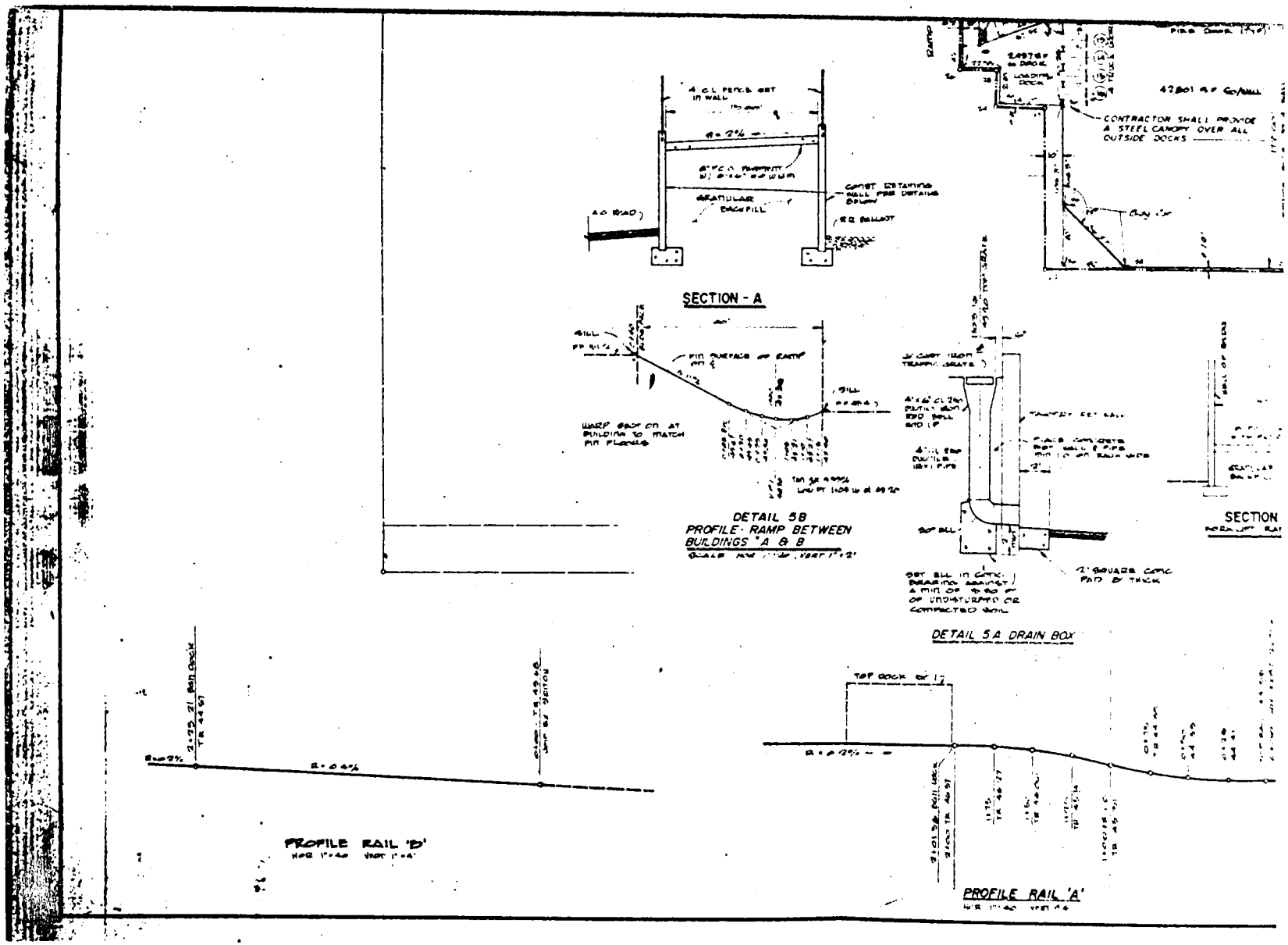
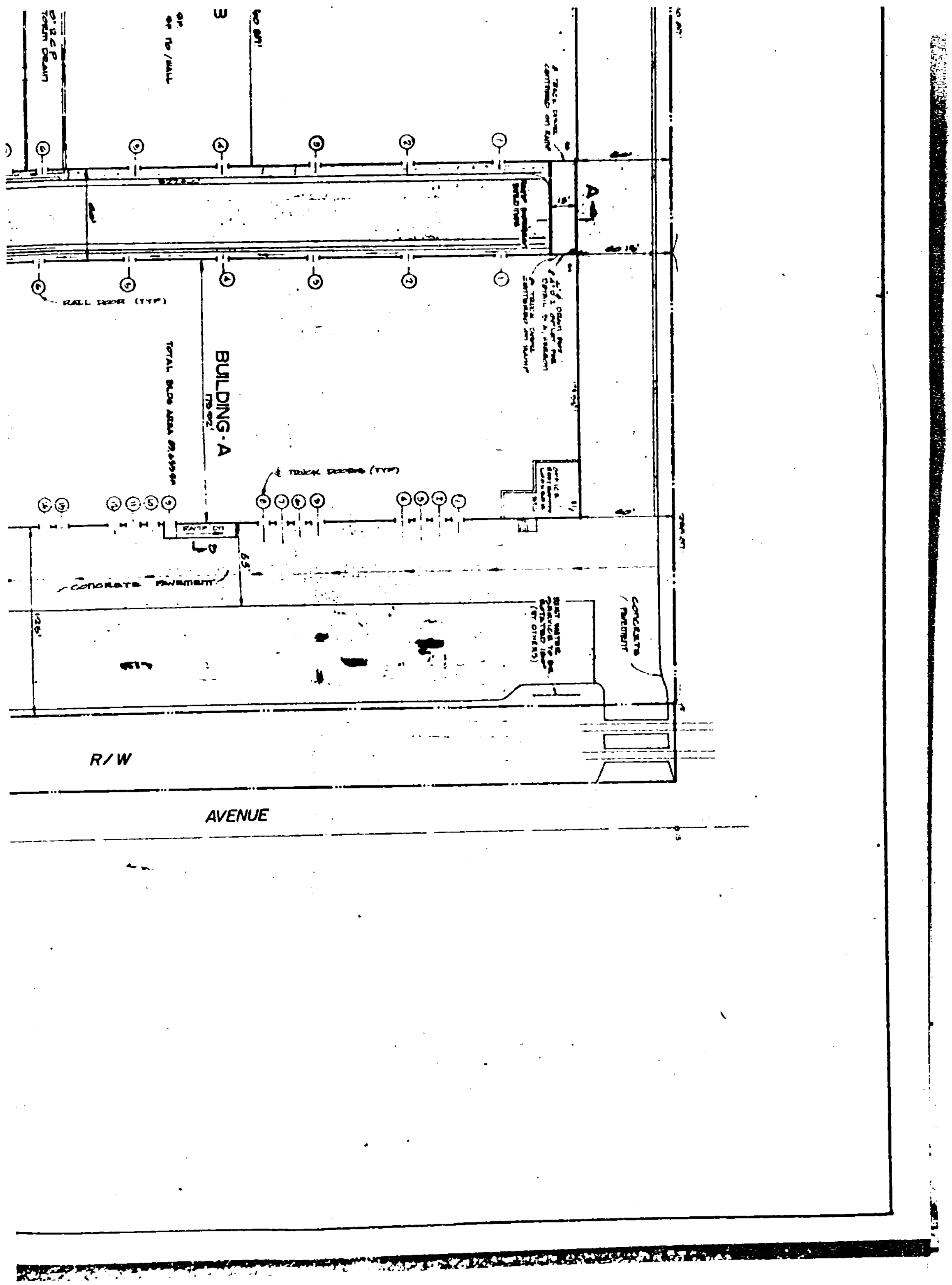
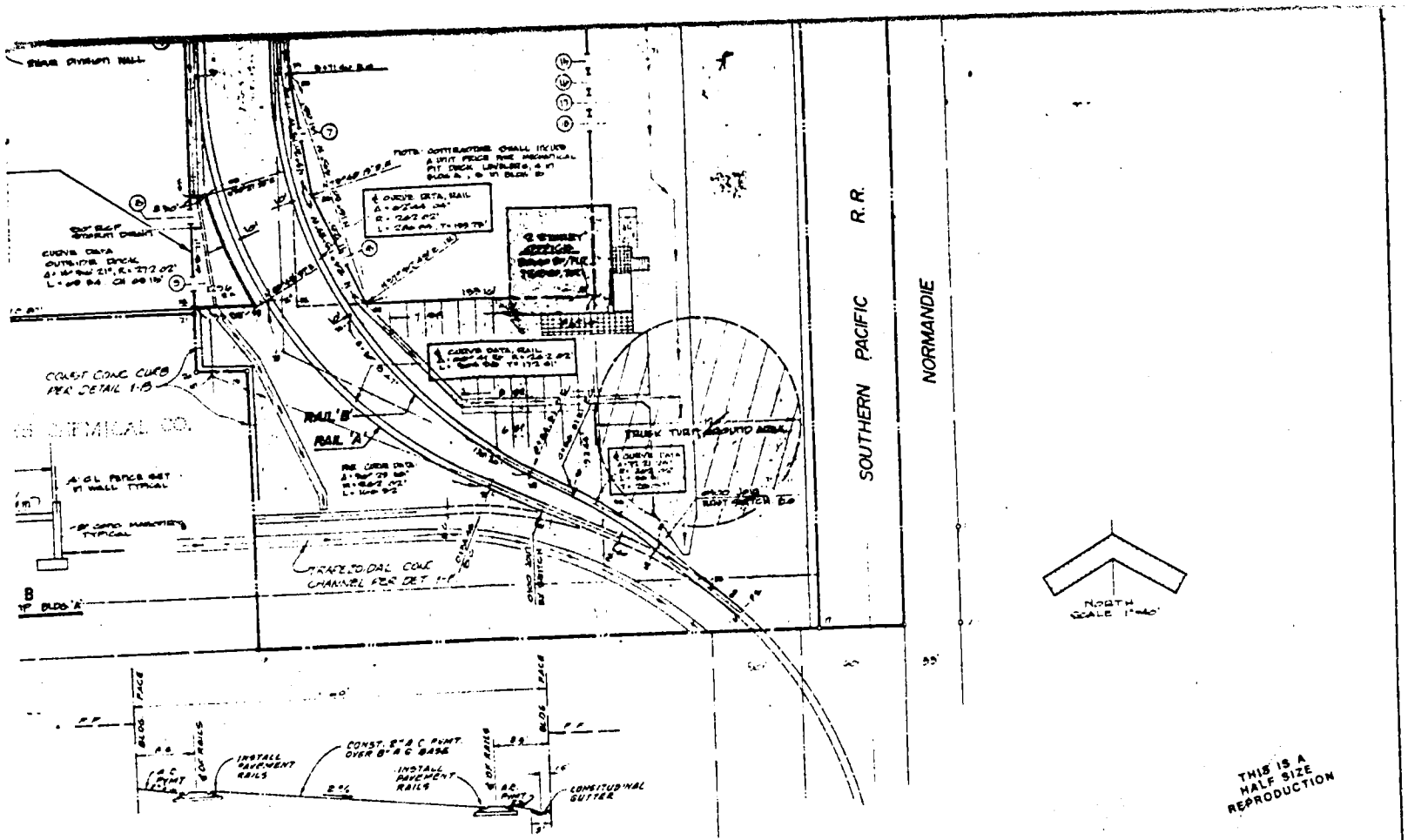




R/W
AVENUE
BUILDING·A
RAIL DOOR (TYP)
TRUCK DOORS (TYP)
CONCRETE PAVEMENT



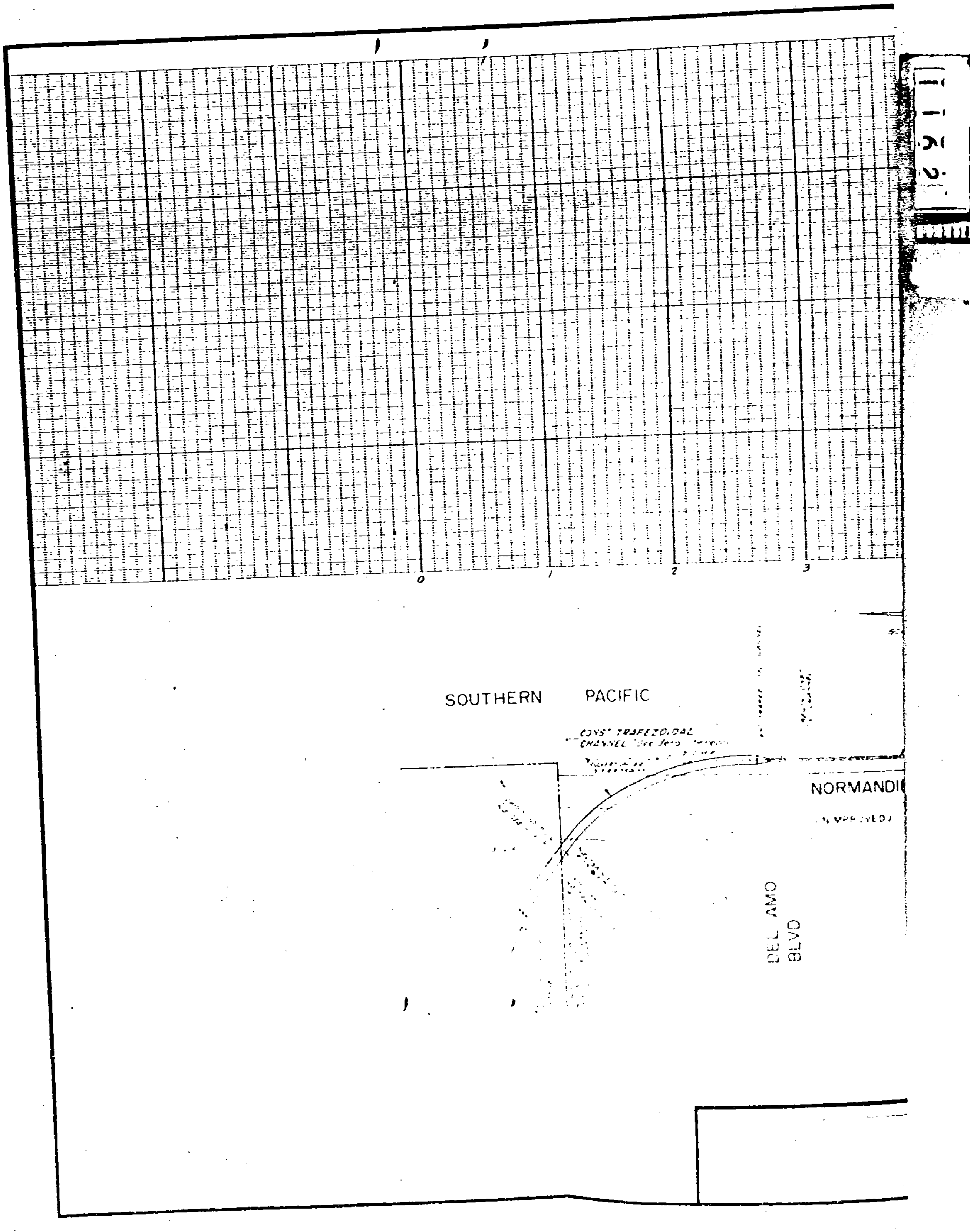
DESIGN ENGINEER
O'MALLEY ENGINEERING COMPANY
1815 POMONA ROAD · CORONA, CA 91720
714 734 0633

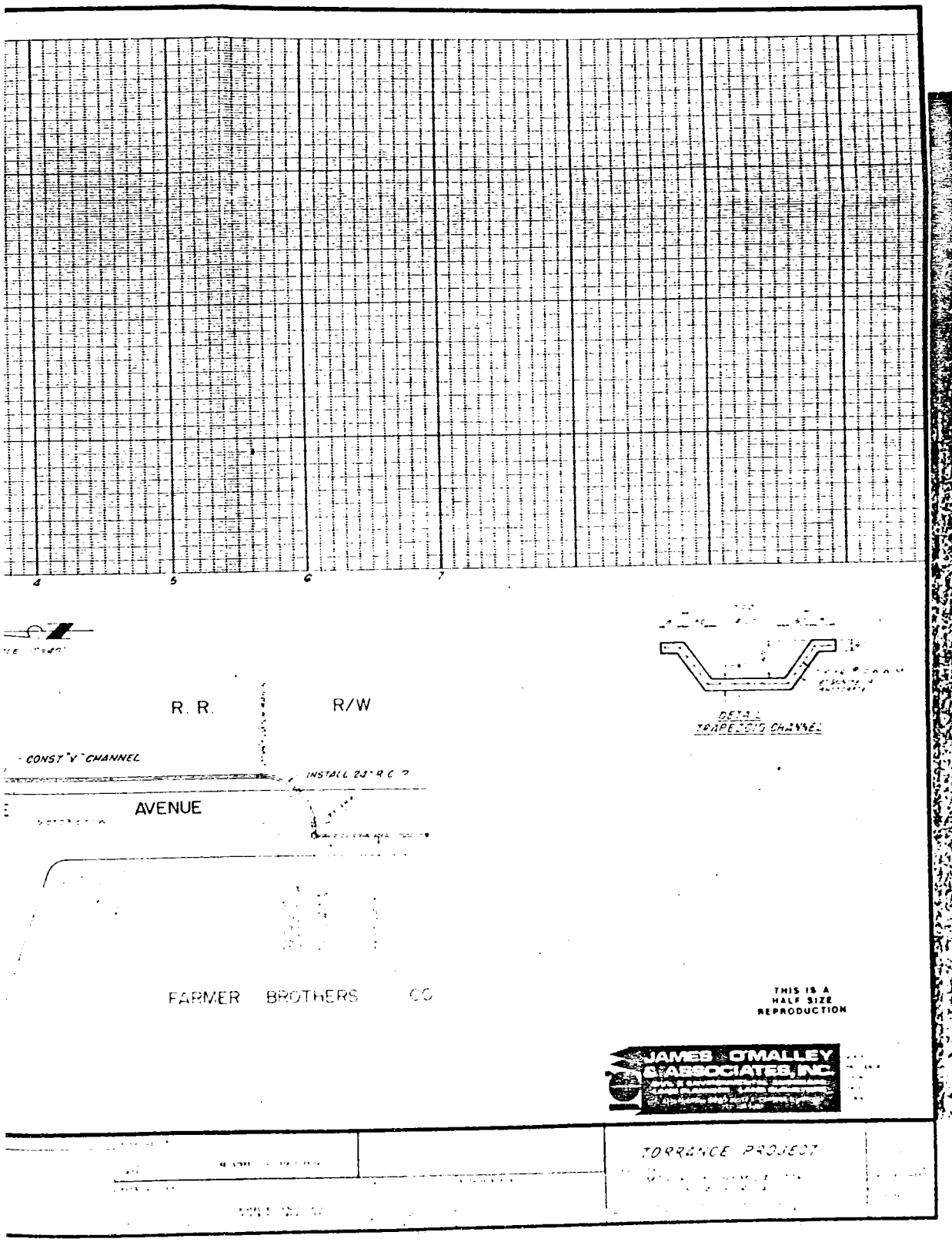
OWNER - DEVELOPER
STAUFFER CHEMICAL COMPANY
636 CALIFORNIA ST · SAN FRANCISCO 94108
415 544 9000

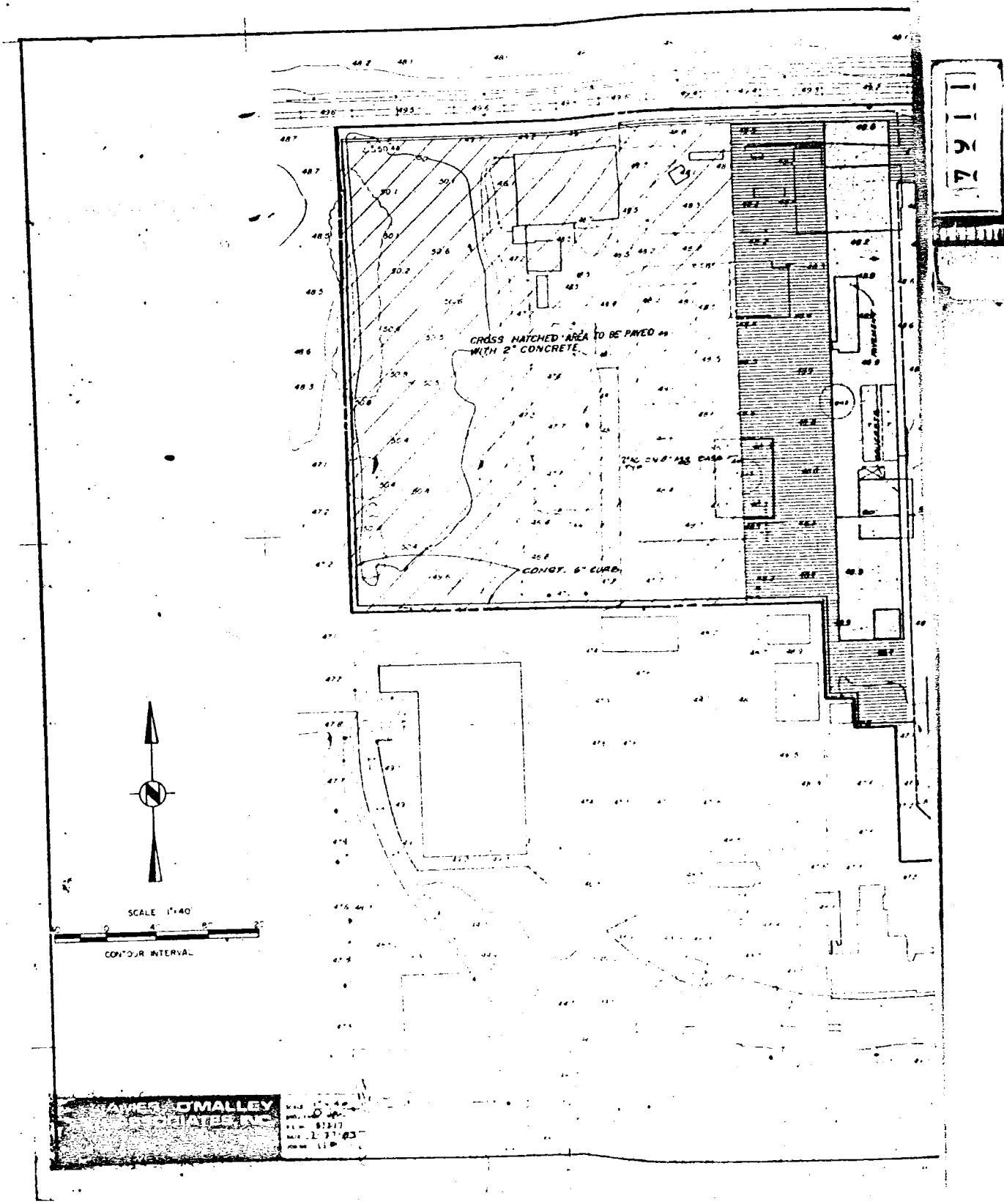
STAKING PLAN & DETAILS

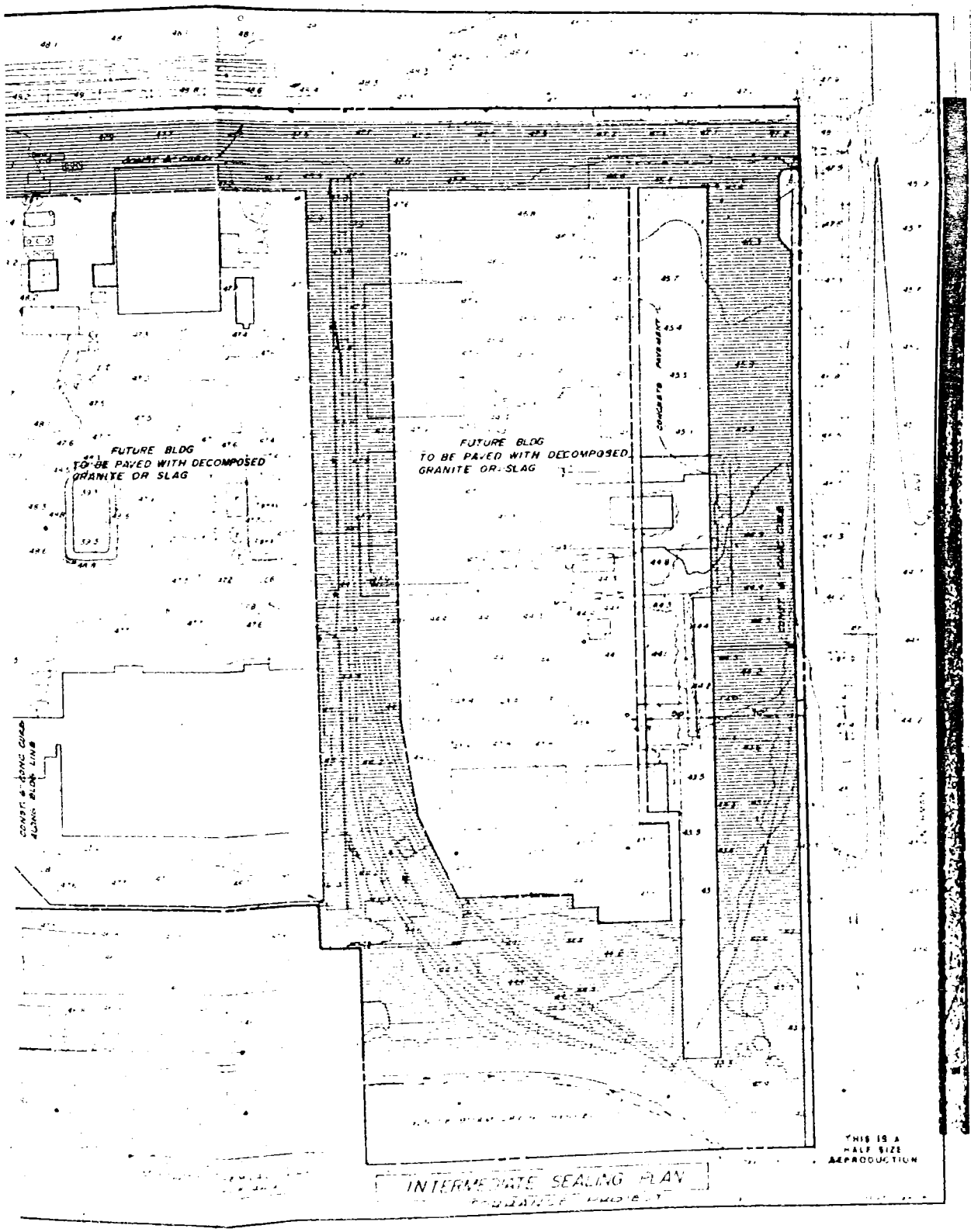
TORRANCE PROJECT

SHEET 5 OF 5

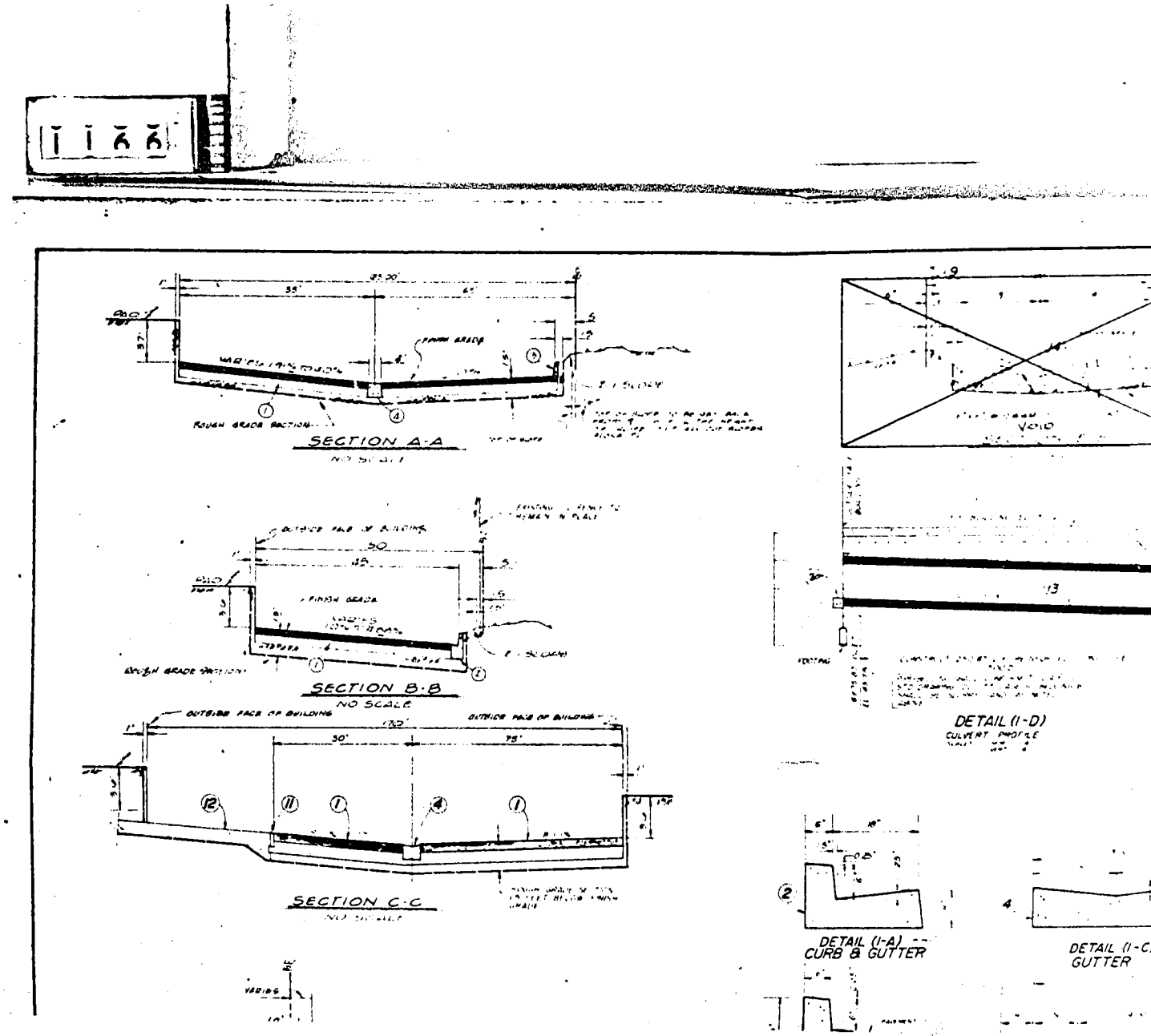





CROSS HATCHED AREA TO BE PAVED WITH 2" CONCRETE
CONST. 6" CURB
SCALE 1"=40'
CONTOUR INTERVAL



INTERMEDIATE SEALING PLAN



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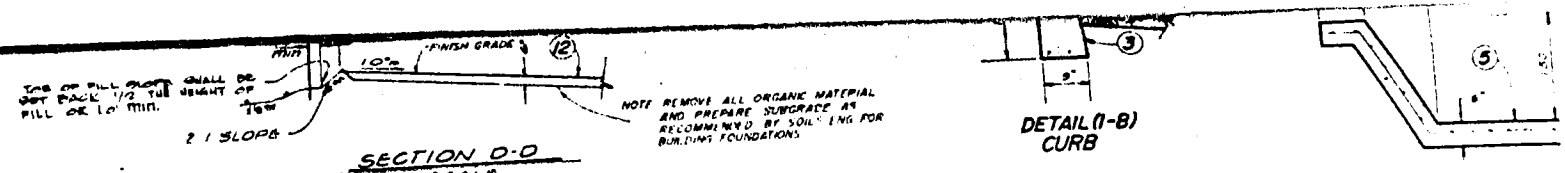
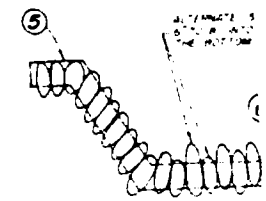


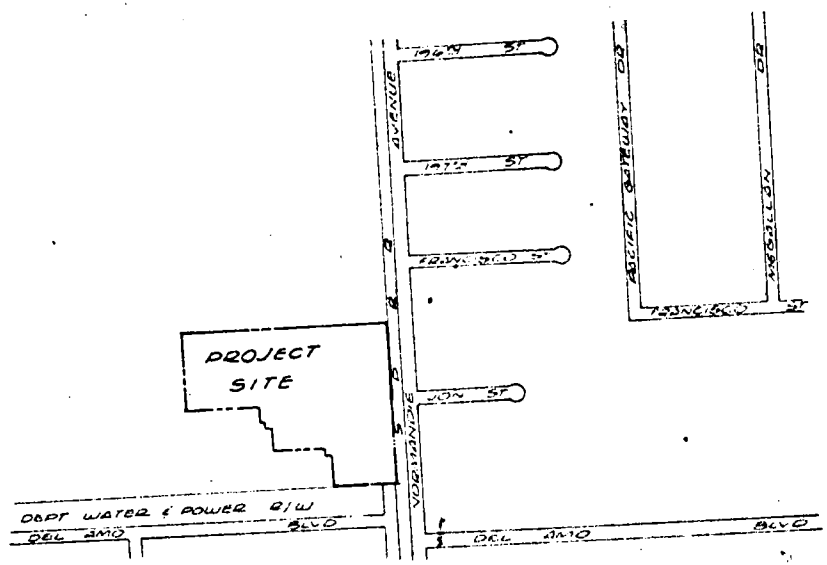
SECTION 0-0
NO SCALE

DETAIL (1-B)
CURB

DETAIL (1-I
TRAPEZOID



DETAIL (1-G
RIP RAP ENER



INDEX MAP
SCALE 1" = 300'

LEGEND

PERMIT DATA	
EXCAVATION	35,000 CY
PROCESSING	10,000 CY
SHRINKAGE	4,500 CY
FILL	30,500 CY
P.C. NUMBER	3142
P.C. FEE	$ 1,183.00
PERMIT NO	
PERMIT FEE	$ 1,820.00

TRIAD FOUND ENGINEERING

Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this Project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the City, the District and the Engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this Project, excepting for liability arising from the sole negligence of the City or the Engineer.

1168

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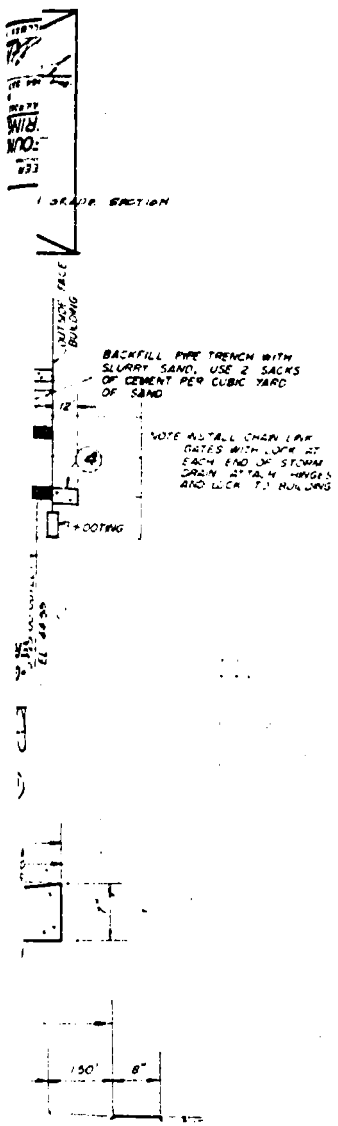

LEGAL DESCRIPTION

PARCEL 1.

PARCEL "A" OF PARCEL MAP NO. 1213 AS PER MAP RECORDED IN BOOK 14 PAGE 83 OF PARCEL MAPS IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY, CALIFORNIA.

PARCEL 2.

THAT PORTION OF THE 635.07 ACRE TRACT, IN THE RANCHO SAN PEDRO, IN THE CITY OF LOS ANGELES, ALLOTTED TO GUADALUPE MARCELINA DOMINGUEZ, BY THE FINAL DECREE OF PARTITION OF SAID RANCHO HAD IN CASE NO. 3284 OF THE SUPERIOR COURT OF SAID COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTH LINE OF TRACT NO. 4483 AS PER MAP RECORDED IN BOOK 58 PAGE 84 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, WITH THE SOUTHEASTERLY LINE OF LOT "A", TRACT NO. 1527, AS PER MAP RECORDED IN BOOK 22 PAGES 82 AND 83 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY; THENCE ALONG THE NORTH LINE OF SAID TRACT NO. 4483, SOUTH 89 59' 51" EAST 17.32 FEET TO THE WEST LINE OF A PACIFIC ELECTRIC RAILWAY RIGHT OF WAY 15.00 FEET WIDE; THENCE ALONG SAID WEST LINE OF SAID RIGHT OF WAY, NORTH 0 01' 39" WEST 173.16 FEET TO THE NORTHEASTERLY CONTINUATION OF THE SAID SOUTHEASTERLY LINE OF SAID LOT "A", TRACT NO. 1527, SAID LINE BEING A CURVE CONCAVE NORTHWESTERLY HAVING A RADIUS OF 789.49 FEET; THENCE SOUTHWESTERLY ALONG SAID CURVE 171.75 FEET TO THE POINT OF BEGINNING.

PARCEL 3.

THAT PORTION OF THE 635.07 ACRE TRACT, IN THE RANCHO SAN PEDRO IN THE CITY OF LOS ANGELES, ALLOTTED TO GUADALUPE MARCELINA DOMINGUEZ, BY THE FINAL DECREE OF PARTITION OF SAID RANCHO HAD IN CASE NO. 3284 OF THE SUPERIOR COURT OF SAID COUNTY, DESCRIBED AS FOLLOWS:

FROM THE SOUTHEAST CORNER OF SAID 635.07 ACRE TRACT NORTH 89 59' 51" WEST 87.00 FEET; THENCE NORTH 0 55' WEST 423.83 FEET TO THE MOST NORTHERLY CORNER OF SAID PARCEL OF LAND THE POINT OF BEGINNING; THENCE SOUTHERLY ON 7 45' 15" CURVE TO THE RIGHT, THE TANGENT OF WHICH BEARS SOUTH 0 55' EAST, A DISTANCE OF 458.35 FEET TO THE SOUTHWEST CORNER, BEING A POINT IN THE ON THE SOUTH LINE OF THE ABOVE MENTIONED 635.07 ACRE TRACT; THENCE SOUTH 89 59' 51" EAST ALONG SAID SOUTH LINE OF 635.07 ACRE TRACT TO THE SOUTHEAST CORNER THENCE NORTHERLY ALONG A 7 15' 44" CURVE PARALLEL TO THE 7 45' 15" CURVE BEFORE MENTIONED A DISTANCE OF 171.76 FEET; THENCE NORTH 0 05' WEST 276.43 FEET TO THE POINT OF BEGINNING.

GENERAL NOTES - SITE WORK

1. ALL SITE WORK SHALL CONFORM TO ALL APPLICABLE SECTIONS OF THE LATEST EDITION OF "STANDARD SPECIFICATIONS FOR PUBLIC WORKS" UNLESS OTHERWISE NOTED IN THE BID DOCUMENTS.
2. A SOIL REPORT IS AVAILABLE FOR BIDDERS REVIEW AT THE OFFICE OF O'MALLEY ENGINEERING COMPANY.
3. PLACE 4" OF COMPACTED AGGREGATE BASE MATERIAL UNDER ALL CURB, CURB GUTTER, GUTTER AND CONCRETE PAVEMENT.
4. CRUSHED MISCELLANEOUS BASE MATERIAL WILL BE STOCKPILED ONSITE FOR USE UNDER PAVEMENT AND THE WORK ITEMS LISTED IN NOTE 3, ABOVE.

GRADING [illegible]

PERMIT NO. [illegible] JOB ADDRESS 20201 SO NORMANDIE AVE LOS ANGELES, CA.

1. SPECIFICATIONS SHALL HAVE PRECEDENCE OVER DRAWINGS.
2. THE STAMPED SET OF PLANS SHALL BE ON THE JOB SITE AT ALL TIMES.
3. NO WORK WHATSOEVER SHALL BE STARTED IN OR ABOUT A GRADING PROJECT WITHOUT FIRST NOTIFYING THE GRADING INSPECTOR.
4. NO GRADING WORK, INCLUDING IMPORT AND EXPORT, SHALL BE DONE BETWEEN THE HOURS OF 6:00 P.M. AND 7:00 A.M. ON ANY DAY AND NO WORK SHALL BE DONE ON SUNDAY AT ANY TIME.
5. WATER SHALL KEEP THE CONSTRUCTION AREA SUFFICIENTLY DAMPENED TO CONTROL DUST CAUSED BY GRADING AND CONSTRUCTION. OWNER SHALL, AT ALL TIMES, PROVIDE REASONABLE CONTROL OF DUST CAUSED BY WIND.
6. IF A GRADING JOB EXTENDS OVER A PERIOD OF TIME EXCEEDING SIX MONTHS, THE DEPARTMENT MAY REQUIRE PLANTING OF THOSE PORTIONS OF THE JOB WHERE ALL OTHER GRADING REQUIREMENTS HAVE BEEN MET IN ORDER TO PREVENT DUST AND EROSION.
7. HIGHWAY EQUIPMENT SHALL BE KEPT IN GOOD OPERATING CONDITION AND MUFFLED AS REQUIRED BY LAW.
8. CONTRACTOR SHALL CONTROL NOISE RESULTING FROM REPAIR OF HEAVY EQUIPMENT AFTER NORMAL WORKING HOURS BY LOCATING SUCH ACTIVITIES AS FAR AS PRACTICABLE FROM ADJACENT INHABITED AREAS AND SO THAT SUCH ACTIVITIES DO NOT CONSTITUTE A PUBLIC NUISANCE OR DISTURB THE PEACE.
9. THE TRAFFIC BUREAU OF THE LOS ANGELES POLICE DEPARTMENT SHALL BE NOTIFIED PRIOR TO THE START OF HAULING. [illegible]
10. A HAUL ROUTE SATISFACTORY TO THE GRADING DIVISION SHALL BE DETAILED ON THE PLANS.
11. THE EXPORT OR IMPORT OF ANY FILL MATERIAL SHALL BE COMPLETED WITHIN THE MAXIMUM TIME LIMIT OF [illegible] FROM THE START OF HAULING.
12. THE FILL MATERIAL IN EACH [illegible] SHALL BE KEPT [illegible] TO PREVENT SPILLAGE AND SHALL BE SUFFICIENTLY WET DOWN TO PREVENT DUST.
13. NO PERSON SHALL, WHEN HAULING ANY EARTH, SAND, GRAVEL, ROCK, STONE, DEBRIS, PAPER, OR ANY OTHER SUBSTANCE OVER ANY PUBLIC STREET, ALLEY OR OTHER PUBLIC PLACE, ALLOW SUCH MATERIALS TO BLOW OR SPILL OVER AND UPON THE PUBLIC STREET, ALLEY OR OTHER PUBLIC PLACE OR ADJACENT PRIVATE PROPERTY.
14. NO PERSON SHALL, WHEN EXCAVATING, COMPACTING, HAULING OR MOVING EARTH, SAND, GRAVEL, ROCK, STONE, DEBRIS OR ANY OTHER SIMILAR SUBSTANCE, CAUSE, ALLOW OR PERMIT ANY MUD, EARTH, SAND, GRAVEL, ROCK, STONE, DEBRIS OR OTHER SUBSTANCE TO DROP, BE DEPOSITED, OR FALL FROM THE BODY, TIRES, OR WHEELS OF ANY VEHICLE USED UPON ANY PUBLIC STREET OR ALLEY WITHOUT IMMEDIATELY AND PERMANENTLY REMOVING THE SAME THEREFROM.
15. PERMISSION SHALL BE SECURED FROM THE DEPARTMENT OF PUBLIC WORKS IF THE TRUCKS ARE LOADED IN THE STREET.
16. THE LOCATION OF DUMPING EXCESS SOIL SHALL BE APPROVED BY THE GRADING INSPECTOR PRIOR TO STARTING EXCAVATION.
17. [illegible]
18. SLOPES SHALL BE PRESOIL PRIOR TO PLACING FILL.
19. LOOSE MATERIAL SHALL NOT EXCEED [illegible] IN DEPTH ON A FILLED SLOPE.
20. ALL DEBRIS AND FOREIGN MATERIAL SHALL BE REMOVED FROM THE SITE.
21. ALL LOOSE FILL SHALL BE REMOVED AND COMPACTED.
22. BUILDING SHALL BE LOCATED CLEAR OF THE TOP OF ALL SLOPES [illegible] HORIZONTAL TO ONE VERTICAL ACCORDING TO THE FOLLOWING:
    A. A MINIMUM OF THREE FEET, PROVIDED THE SLOPE DOES NOT EXCEED SIX FEET IN VERTICAL HEIGHT.
    B. ONE-HALF THE VERTICAL HEIGHT WITH A MAXIMUM OF 15 FEET FOR SLOPES EXCEEDING SIX FEET.
    EXCEPTION: [illegible]
23. TOPS OF CUT SLOPES SHALL NOT BE MADE NEARER TO A PROPERTY LINE THAN ONE FOOT, PLUS ONE-FIFTH THE HEIGHT OF THE CUT, BUT NEED NOT EXCEED A HORIZONTAL DISTANCE OF TEN FEET.
24. DRIVEWAY GRADES SHALL NOT EXCEED 20 PER CENT. [illegible]
25. DRIVEWAY GRADES EXCEEDING [illegible]
26. [illegible]

1169

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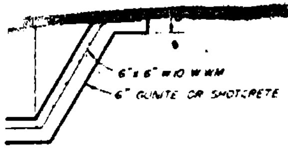
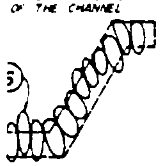


F)
CHANNEL

TONES SHALL EXTEND WATERWAY ALONG OF THE CHANNEL



NOTES DETAIL 1-G
1. ALL RIP RAP SHALL BE FIRMLY IMBEDDED IN GROUT
2. MATCH EXISTING SECTION OF CHANNEL AT SITE BOUNDARY

)
GY DISSIPATOR

SCHEDULE OF WORK ITEMS

1. CONSTRUCT [illegible] A.C. ON [illegible] AGGREGATE BASE MATERIAL.
2. CONSTRUCT [illegible] CURB AND [illegible] GUTTER PER DETAIL 1-A.
3. CONSTRUCT [illegible] CURB ONLY PER DETAIL 1-B.
4. CONSTRUCT [illegible] GUTTER PER DETAIL 1-C.
5. CONSTRUCT PAVED TRAPEZOID STORM DRAIN CHANNEL PER DETAIL 1-F.
6. CONSTRUCT RIP RAP ENERGY DISSIPATOR [illegible] TO TRAPEZOID CHANNEL PER DETAIL 1-[illegible].
7. REMOVE EXISTING SPUR TRACKS AND STOCKPILE ON SITE AS DIRECTED BY ENGINEER. TRACK REMOVAL IS NOT INCLUDED IN EARTHWORK CONTRACT.
8. CONSTRUCT SPUR TRACKS, NOT INCLUDED IN EARTHWORK CONTRACT.
9. CONSTRUCT [illegible] FOOT HIGH CHAIN LINK FENCE.
10. REMOVE AND SALVAGE EXISTING CHAIN LINK FENCE MATERIAL AND STOCKPILE ON SITE AS DIRECTED BY ENGINEER.
11. CONSTRUCT 2" X [illegible] REDWOOD HEADER.
12. PLACE [illegible] OF DECOMPOSED GRANITE ON PREPARED SUBGRADE.
13. CONSTRUCT [illegible] REINFORCED CONCRETE PIPE ([illegible]) STORM DRAIN PER DETAIL [illegible] 1-C
14. CONSTRUCT 6" CONCRETE PAVEMENT WITH FLOW LINE.
15. REMOVE INTERFERING PORTIONS OF EXISTING CURB AND GUTTER AND CONSTRUCT A [illegible] FOOT WIDE DRIVEWAY PER CITY OF LOS ANGELES STD. PLAN NO. S-440-[illegible] CASE 2.
16. CONSTRUCT MASONRY WALL AND CHAIN LINK FENCE BETWEEN BUILDINGS PER DETAIL 2-A.
17. REMOVE EXISTING DRIVEWAY AND REPLACE WITH CURB AND GUTTER AND PAVEMENT AS NECESSARY TO REPAIR NORMANDIE AVENUE TO THE SATISFACTION OF THE CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS.
18. CLEAR AND GRUB EXISTING DRAINAGE DITCH AND REMOVE EXISTING WOOD REVETMENT.
19. CONSTRUCT 6 FOOT HIGH BY 20 FEET WIDE CHAIN LINK SLIDE GATE.
20. CONSTRUCT 6" THICK CONCRETE PAVEMENT WITH 6" x 6" # 4 x # 4 W W M CONCRETE SHALL BE MINIMUM [illegible] LB COMPRESSION AT 28 DAYS.
21. CONSTRUCT 24" R.C.P. CULVERT, (1500 D)

[illegible] THAT PLANS FOR SUCH WORK BE AMENDED TO INCLUDE ADEQUATE SAFETY PRECAUTIONS.

27. SANITARY FACILITIES SHALL BE MAINTAINED ON THE SITE FROM [illegible] TO COMPLETION OF GRADING OPERATIONS.
28. ALL RECOMMENDATIONS AND CONDITIONS OF THE SOILS REPORT BY Triad Foundation Engineering, Inc. DATED February [illegible], THE GEOLOGICAL REPORT BY [illegible] DATED [illegible] AND THE BOARD OF BUILDING AND SAFETY COMMISSIONERS APPROVAL LETTER [illegible] SHALL BE PART OF THE PLANS.
29. [illegible] FOR CONCRETE DRAINAGE DEVICES SHALL BE CONSTRUCTED AS REQUIRED BY [illegible].
30. THE ENGINEERING GEOLOGIST, SOILS ENGINEER AND CIVIL ENGINEER SHALL COMPLY WITH BOARD RESOLUTION NO. [illegible] AND [illegible] AND SHALL PROVIDE THE DEPARTMENT WITH A GRADING CERTIFICATION UPON COMPLETION OF THE JOB.
31. AN AS GRADED PLAN AT A SCALE OF [illegible] PREPARED BY THE [illegible] ENGINEER SHALL BE SUBMITTED WITH THE [illegible] GRADING CERTIFICATIONS TO THE DEPARTMENT UPON JOB COMPLETION.
32. THE PERMITTEE SHALL [illegible] CONTROL DURING THE GRADING OPERATION [illegible] IN COMPLIANCE WITH APPROVED PLANS AND WITH THE MUNICIPAL CODE. WHEN NECESSARY, THE PERMITTEE SHALL [illegible] SERVICES TO [illegible] SUPERVISION [illegible].
33. SUBDRAINS SHALL BE [illegible] ALL [illegible] WATERCOURSES. SUBDRAINS SHALL BE PLACED ALONG THE WATERCOURSE FLOW LINE AND ALONG THE FLOW LINE OF ANY [illegible] TRIBUTARY THERETO. ADDITIONAL SUBDRAINS SHALL BE INSTALLED TO COLLECT ANY ACTIVE OR POTENTIAL SPRINGS OR SEEPS WHICH WILL BE COVERED BY THE FILL. SUBDRAINS SHALL BE INSTALLED AFTER [illegible] HAS BEEN EXCAVATED TO FIRM MATERIAL IN THE AREA [illegible] THE FILL. [illegible] SHALL BE SHOWN ON [illegible] PLAN FOR CITY APPROVAL [illegible] RECOMMENDATIONS OF THE SOILS ENGINEER AND [illegible] TO THE SATISFACTION OF THE [illegible].

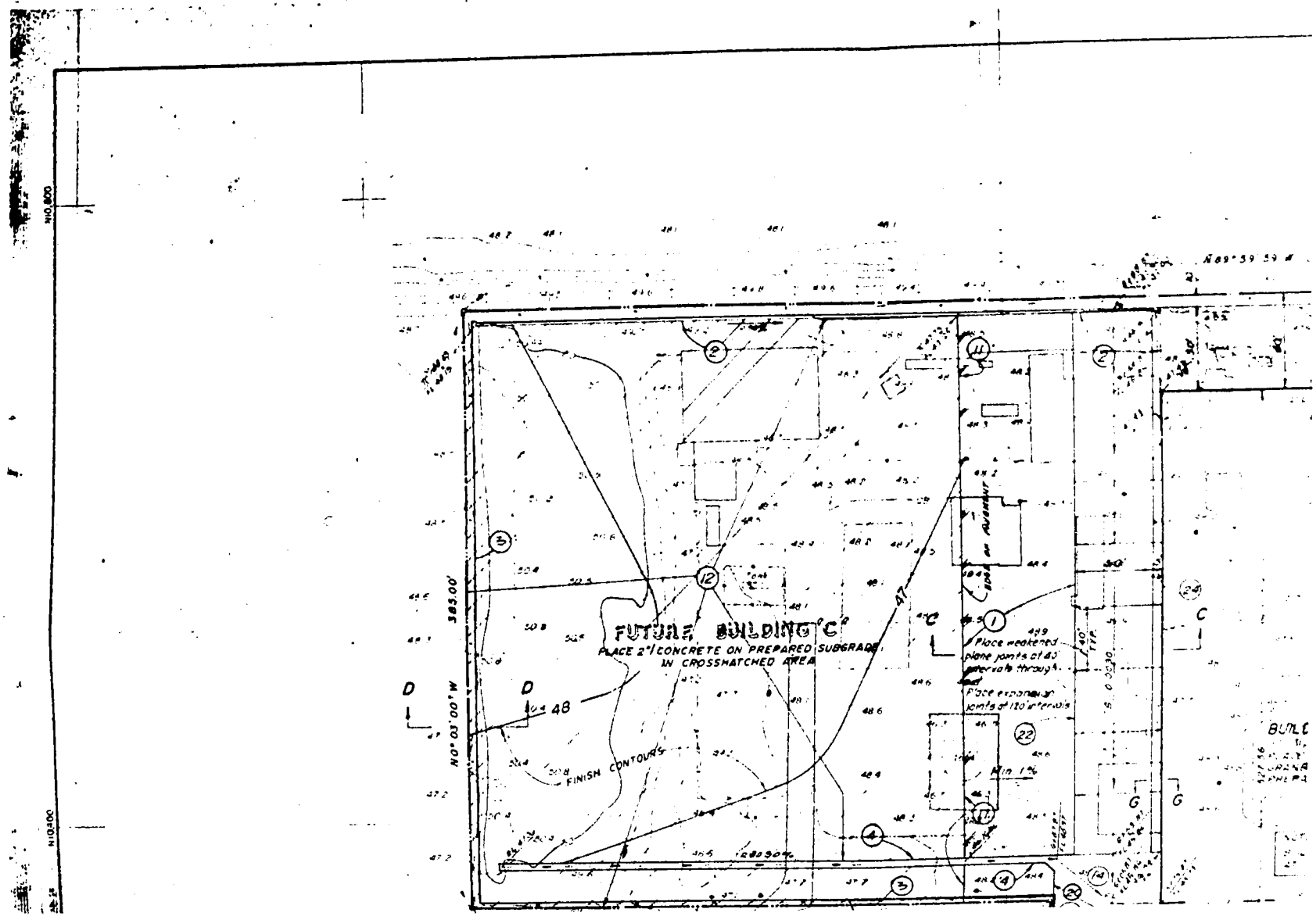
THIS IS A HALF SIZE REPRODUCTION

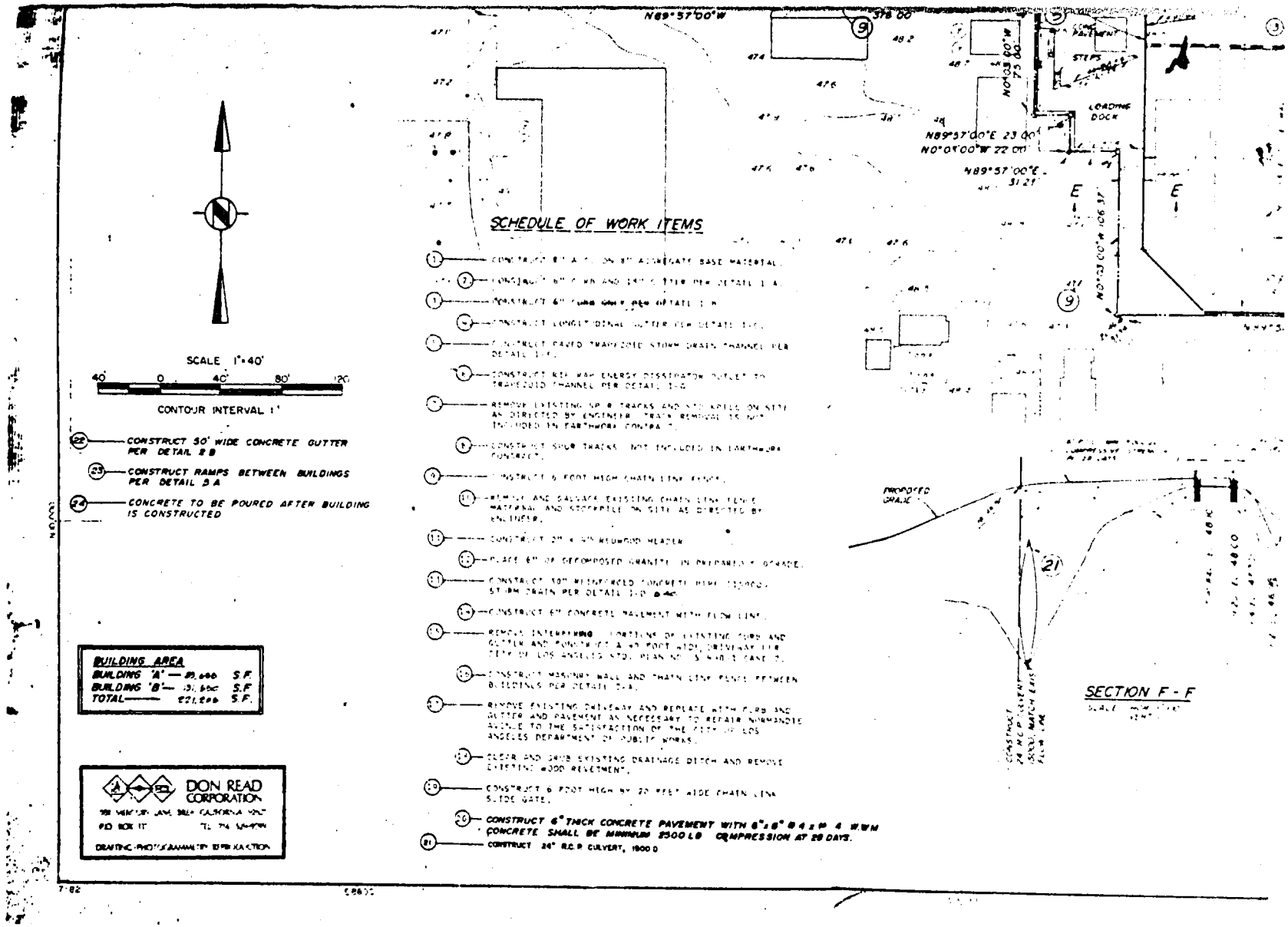
SHEET 1 OF 5 SHEETS

JOB ADDRESS

ATION INC.	OWNER-DEVELOPER STAUFFER CHEMICAL CO. 636 CALIFORNIA STREET SAN FRANCISCO, CALIF 94119 (415) 544-9221-	PREPARED BY O'MALLEY ENGINEERING 1215 POMONA ROAD SUITE E CORONA, CALIF 91720 (714) 734-0633	SITE ADDRESS 20201 SOUTH NORMANDIE AVENUE GRADING PLAN, PLOT PLAN WATER DISTRIBUTION PLAN SPUR TRACK PLAN, PARKING PLAN for the TORRANCE PROJECT

JN 82-110





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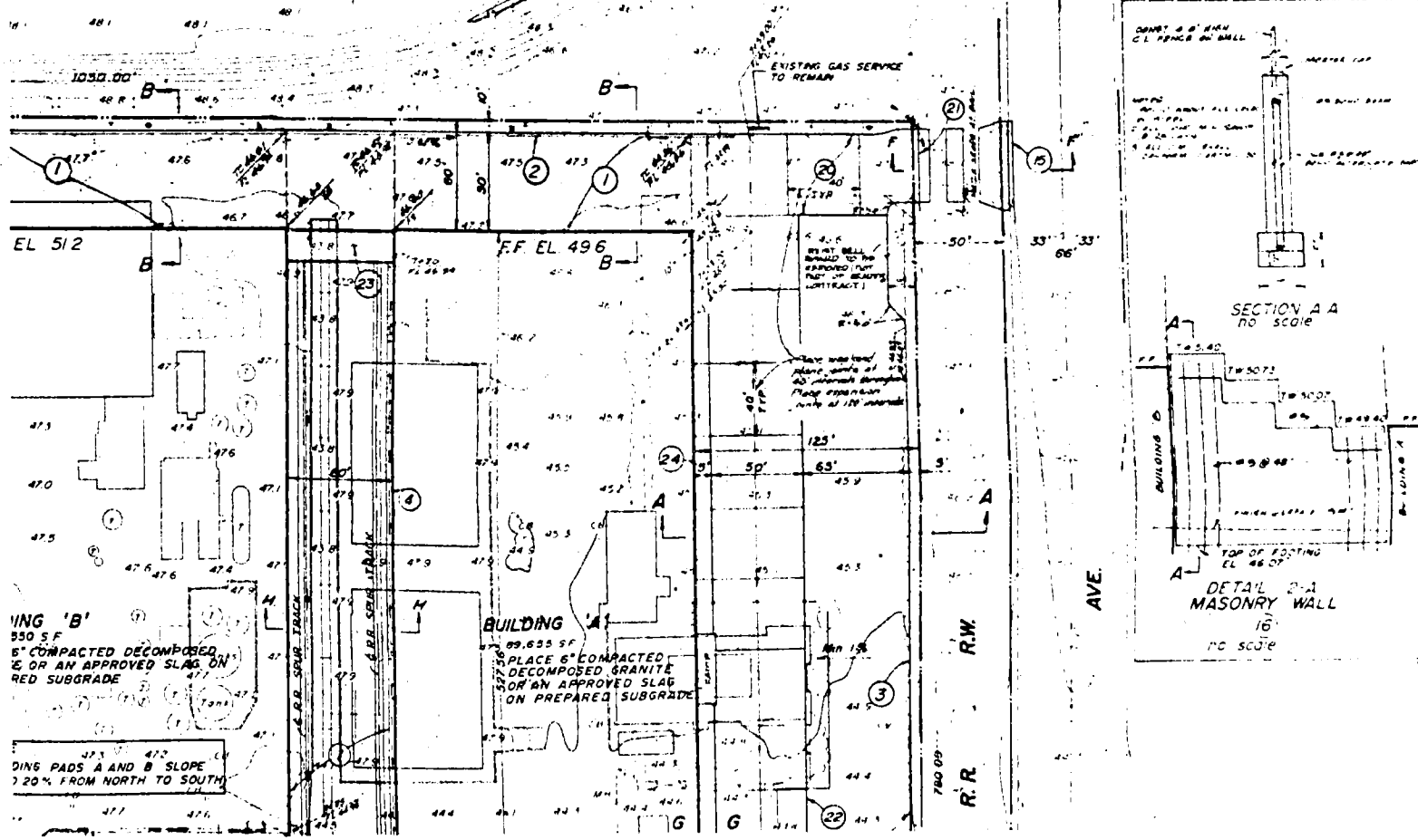
NOTE: ENGINEER WILL DIRECT POUR SEQUENCE FOR CONCRETE IN THE FIELD



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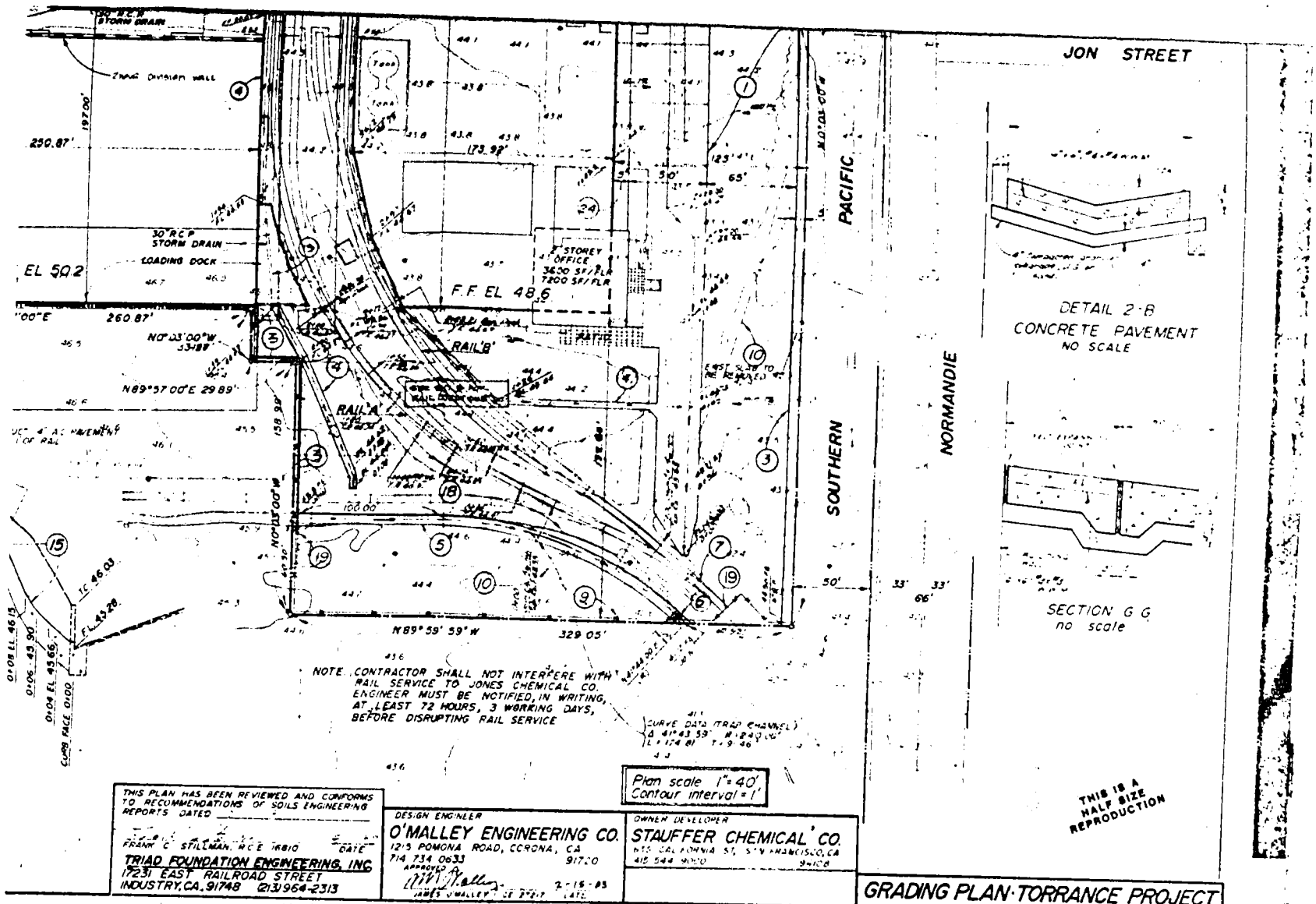

THIS PLAN HAS BEEN REVIEWED AND CONFORMS TO RECOMMENDATIONS OF SOILS ENGINEERING REPORTS DATED _____

FRANK C. STILLMAN, RCE 18810 DATE

TRIAD FOUNDATION ENGINEERING, INC
17231 EAST RAILROAD STREET
INDUSTRY, CA. 91748 (213) 964-2313

DESIGN ENGINEER
O'MALLEY ENGINEERING CO.
1215 POMONA ROAD, CORONA, CA 91720
714 734 0633
APPROVED BY _____ 2-16-83
JAMES O'MALLEY, RCE 27217 DATE

OWNER DEVELOPER
STAUFFER CHEMICAL CO.
MTG. CALIFORNIA ST., S.F.N. FRANCISCO, CA
415 544 6000

GRADING PLAN · TORRANCE PROJECT
SHEET 2 OF 5
JN 82110

BOE-C6-0176973

Appendix E

ALTERNATIVE
REMEDIAL MEASURES

Appendix E

ALTERNATIVE REMEDIAL MEASURES

EVALUATION OF ALTERNATIVES

Several technically feasible permanent remedial measures were examined as possible alternatives to portions of the surface sealing program proposed by Montrose Chemical Corporation for the Torrance site. The measures and their most significant advantages and disadvantages are described below. The primary purpose of the permanent remedial measures is to prevent further dissemination of DDT-laden sediments through the environment by either removing them to a geologically secure location or isolating them in place to prevent erosion and infiltration of water or other liquids.

The most cost-effective solution for the Montrose site and offsite areas of concern will probably be a combination of several of these methods.

Alternative 1 - Excavation and Disposal

The most positive method of eliminating future erosion or infiltration of DDT-contaminated sediments is to excavate soil showing DDT concentrations higher than local background levels (1-5 ppm) as documented by the Los Angeles County Health Department. The contaminated soils would then be removed to a better engineered or environmentally less sensitive area such as a Class I landfill.

Advantages. This method eliminates the need for surface capping of the site or the offsite areas contaminated with

high DDT concentrations. It is the most certain means of protecting public health and preventing future releases from this area. Future monitoring or maintenance of a capping system would be unnecessary.

Disadvantages. The disadvantages of this method are the high cost in the excavation and removal of the contaminated material to a Class I landfill; the reduction of the storage capacity of the landfill; and the possible additional public health risks from aerial transport of contaminated dust during excavation and the possibility of spills in transit. In addition, a detailed sampling program would be required to verify that the contaminated soils at the bottom of the excavation have been removed to acceptable concentrations. It may not be possible to complete excavation and sampling by November 1983.

Alternative 2 - Reinforced Concrete

Reinforced concrete capping of the site would result in the placement of a rigid cover as the sealing system. A compacted subbase is necessary beneath the concrete on a properly prepared subgrade. A minimum thickness of 4 inches of concrete (3,000-psi minimimum compressive strength) is necessary with wire mesh reinforcing and expansion and control joints to minimize the potential for cracking and deterioration.

Cracks, if uncorrected, will, with time, allow infiltration and soil erosion of the sealing system. Lateral and vertical ground movements due to earthquakes increase the probability and severity of cracking. A periodic maintenance program also would be necessary to correct any cracking or deterioration of the cap.

Advantages. The cracks can be exposed, cleaned, and repaired (sealed with tar) with relative ease. Concrete covers can have a design life of more than 50 years if properly maintained.

Disadvantages. Rigid barriers such as concrete are the most vulnerable to cracking and chemical deterioration. Periodic maintenance would be necessary to correct cracking or deterioration of the pavement.

Alternative 3 - Asphalt Concrete

Asphalt concrete is a carefully controlled mixture of asphalt cement and graded aggregate--mixed, placed, and compacted under elevated temperature. Properly mixed and placed, it forms a stable, relatively impermeable durable and erosion-resistant cover. The plasticity that enables asphalt concrete to undergo limited deformation without disruption is a characteristic that makes it effective in hydraulic structure applications. The placement of 2 inches of asphalt concrete on a prepared subbase, as proposed, with proper drainage control, is an adequate surface sealing system.

Advantages. Slight movements or differential settlements in subgrade can be accommodated without damage to the cover. The relative ease and effectiveness with which damaged areas can be repaired is an important attribute.

Disadvantages. Asphalt is somewhat susceptible to chemical deterioration. Large settlements or movements of the subgrade can damage (crack) the cap. A periodic maintenance program would be required to correct any cracking, depressions, or deterioration of the pavement to eliminate potential for

surface water erosion or infiltration to the underlying contaminated soils.

Alternative 4 - Soil-Bentonite

Bentonite is a natural clay, composed primarily of montmorillonite, which is extremely fine grained and absorbent. When mixed with water, it swells to several times its original volume; soil-bentonite covers are made by mixing bentonite clay and natural soil in place to create a relatively impermeable barrier (less than 10^{-7} cm/s). A soil bentonite sealant such as American Colloid Company's Volclay SG-40 is available with a 30-year warranty. Installation and mixing of the bentonite is accomplished with readily available construction equipment but requires supervision by a representative of the manufacturer.

An adequate soil-bentonite soil would be provided by (1) placing a minimum 6-inch thick layer of clean soil over the contaminated area; (2) mixing bentonite (1.5 to 4 lb/ft^2, depending on permeability of soil) with this clean soil to achieve a minimum 4-inch thick bentonite-soil mixture, (3) placing an additional 18-inch thick layer of clean soil over the bentonite-soil mixture; and (4) planting with natural vegetation. The upper 18 inches of soil is designed to minimize desiccation cracking of the bentonite and protect it from root penetration. The vegetative cover is necessary to minimize surface erosion.

Advantages. In the event of a crack occurring or the seal being broken by penetrating objects, the bentonite will deform but will subsequently reseal itself.

This method would lend itself to the sealing of any area where

excavation and disposal of highly contaminated soils is performed (state law requires clean fill to be returned to hazardous waste excavations on an equal volume basis).

Disadvantages. Care in placement is required and sufficient soil and vegetative cover is necessary to minimize cracking. The presence of a soil-betonite seal would not be obvious to an uninformed person excavating through it. Performance as an imipermeable barrier is dependent on proper maintenance and resealing any excavations.

Alternative 5 - Synthetic Liner

A synthetic liner is a manufactured impermeable barrier that will protect the underlying DDT-contaminated soil from surface erosion and water infiltration. The liner is a semirigid plastic and capable of tolerating local deformation resulting from differential soil settlement from most operational loadings. The liner application at the site would require the placement of a 6-inch thick sand supporting layer to provide a uniform contact surface for the liner. A high density polyethylene liner with a minimum thickness of 40 mils with heat or extruded welds at the seams joining the sheets is recommended. A minimum cover layer of 12 inches of soil should be installed to allow distribution of point bearing stresses on the liner and to permit the establishment of a vegetative cover to minimize erosion of the cover soil. The liner should be graded to drain to collection ditches or catchbasins. Buried high density polyethylene liners have a life expectancy of at least 30 years.

The chemical constitutents to which the liner is to be exposed must be established to ensure compatability between the liner and the environment.

Advantages. Synthetic liners are the most flexible covers. Design life is relatively long (service proven at least 30 years). If the synthetic material is properly selected for compatibility with the existing soil conditions and contaminants, it is not susceptible to cracking or chemical deterioration. It is easily repaired.

Disadvantages. Special sealing techniques are required for proper installation. Some maintenance of the cover soil would be necessary.

Appendix F

ENFORCEMENT ORDERS

GEORGE DEUKMEJIAN, Governor

STATE OF CALIFORNIA—~~RESOURCES AGENCY~~

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012—4596
(213)620-4460

RECEIVED
EPA REGION IX
MAY 10 11 AM '83

May 6, 1983

CERTIFIED NO. 838416

Montrose Chemical Corporation of California
P.O. Box E
Union, New Jersey 07083

Gentlemen:

Recent analyses of samples of rainwater runoff from your facility and affected soil samples from adjacent property have revealed the presence of dichloro diphenyl trichlorethane (DDT) in concentrations as high as 1,410 parts per billion (ppb) in water and 8,274 parts per million (ppm) in soil. Rainfall runoff from your property drains to Dominguez Channel and Los Angeles Harbor, waters of the State, and the release of such concentrations of this hazardous substance poses a substantial threat to the public health and to the environment.

Enclosed is a Clean Up and Abatement Order requiring you to (1) immediately cease the discharge of DDT-contaminated stormwater from your property, (2) conduct a sampling program to determine the extent of DDT contamination in soils at your facility and adjacent property, and (3) implement a remedial program to eliminate the contamination which has resulted from the release of DDT from your facility.

The Order calls for reports to the Board giving the details of the ordered work, and specifies that approval of the Executive Officer is required for each phase of the clean up and abatement process.

Very truly yours,

Raymond M. Hertel

RAYMOND M. HERTEL
Executive Officer

cc: See attached mailing list

Montrose Chemical Corporation of California
P.O. Box 147
Torrance, California 90507

CERTIFIED NO. 838417

ATTENTION: Mr. John L. Kallok, Plant Manager

Enclosure

Attached mailing list

cc: Montrose Chemical Corporation of California,
ATTN: Mr. John L. Kallok, Plant Manager
Environmental Protection Agency, Regional Administrator,
ATTN: Toxics and Waste Management Division
Environmental Protection Agency, ATTN: Kathleen Shimmin
Department of Fish and Game, Region 5, ATTN: Mr. Fred Worthley
Department of Fish and Game, Marine Resources Region, ATTN: Mr. John Baxter
City of Torrance, ATTN: City Attorney
City of Los Angeles, Bureau of Sanitation
Coastal Commission, South Coast District
Los Angeles Regional Board Members
State Water Resources Control Board, Executive Office
ATTN: Mr. Clint Whitney, Executive Director
State Water Resources Control Board, Office of the Chief Counsel
ATTN: Mr. William R. Attwater
ATTN: Mr. Craig Wilson,
ATTN: Mrs. Kathy Keber
Attorney General
Air Resources Board
Governor's Office
Los Angeles County Engineer, Sanitation Division
Department of Water Resources, Attn: Mr. R. Y. D. Chun
Department of Health Services, ATTN: Mr. John Hinton, Los Angeles
Department of Health Services, Berkely
Los Angeles County Health Services
Los Angeles County Flood Control District, ATTN: John Mitchell

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012-4596
(213) 620-4460

GEORGE DEUKMEJIAN, Governor

May 6, 1983

CLEAN UP AND ABATEMENT ORDER NO. 83-1

The California Regional Water Quality Control Board, Los Angeles Region, finds:

1. Montrose Chemical Corporation of California (Montrose) owned and/or operated a facility at 20201 South Normandie Avenue in Torrance, California, for the manufacture and distribution of dichloro diphenyl trichlorethane (DDT). Production of DDT has ceased, and Montrose is now dismantling this facility.

2. The California Department of Health Services approved the RCRA Closure Plans and Procedures submitted by Montrose in August 1982. The Closure Plan addressed only the dismantling and disposal of storage tanks and their contents. However, the discharge of DDT - contaminated rainfall runoff from the facility was not addressed and remains unabated.

3. The discharge of DDT - contaminated rainfall runoff from the facility and adjacent property, its effects on Dominguez Channel waters and subsequently Consolidated Slip waters and sediments, is a condition of pollution which will not be abated until appropriate remedial measures are taken.

4. Montrose is the only facility which has manufactured DDT in the area tributary to the Torrance Lateral of Dominguez Channel and to Consolidated Slip.

5. Storm runoff from the plant property drains through a narrow, unlined channel, ponds, and then overflows into a catch basin approximately 500 feet from the plant. Water in the catch basin flows to Los Angeles County Flood Control District's (LACFCD's) Torrance Lateral which drains into the Dominguez Channel, and ultimately into Consolidated Slip of Los Angeles Harbor.

6. The Water Quality Control Plan for Los Angeles River Basin specifies that:

"No individual pesticide or combination of pestidices shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board."

The Environmental Protection Agency has established ambient water quality criteria to protect human health and aquatic life, as follows:

"For DDT and its metabolites the criterion to protect saltwater aquatic life as derived using EPA Guidelines is 0.0010 µg/l (ppb) as a 24 hour average and the concentration should not exceed 0.13 µg/l at any time.

For the maximum protection of human health from the potential carcinogenic effects due to exposure of DDT through ingestion of contaminated water and contaminated aquatic organisms, the ambient water concentration should be zero, based on the non-threshold assumption for this chemical.

For consumption of aquatic organisms, excluding consumption of water, the levels required for human protection are 0.00024 µg/l (ppb) 0.000024 µg/l, and 0.0000024 µg/l, respectively.

7. Soil and water samples from the drainage path on Montrose and adjacent property collected on November 23, 1981, by California Department of Fish and Game staff showed total DDT concentrations as high as 1,410 parts per billion (ppb) in water and 8,274 parts per billion (ppb) in soil.

8. On November 9 and 10, 1982, Environmental Protection Agency staff collected water samples downstream of the facility as well as adjacent off-site soil samples. Water samples showed concentrations of 209 to 306 ppb total DDT leaving the site and 695 ppb in water ponded off-site. Total DDT concentrations in adjacent offsite soils were as high as 1,900 parts per million (ppm).

9. Los Angeles County Flood Control District has collected water samples from Torrance Lateral at Main Street, a tributary to Dominguez Channel, since 1977. Both storm and dry weather samples are taken. During the period 1977-1982, the average dry weather concentration of total DDT was 0.75 ppb as compared with average wet weather concentrations of 5.88 ppb. Maximum storm water total DDT concentrations have been as high as 35 ppb.

10. The California State Mussel Watch is a marine monitoring program conducted by the California Department of Fish and Game for the State Water Resources Control Board. The Mussel Watch program in Los Angeles-Long Beach Harbors in 1980 revealed elevated levels of DDT in mussels at various stations in the harbors. In 1981, analysis of mussels taken in Consolidated Slip (L.A. Harbor) at the terminus of the Dominguez Channel showed a concentration of 2,395 ppb total DDT.

11. During the course of manufacture, handling and distribution of DDT, residues of this material were intentionally or negligently deposited on and in the soils at various locations at the Montrose facility and adjacent properties where stormwater could come in contact with these residues and carry them off the property.

12. The existing presence of DDT residues in soil causes or threatens to cause a condition of pollution because they could drain or otherwise be carried to waters of the State. This material could be harmful to persons or animals.

13. The discharge of pollutants to waters of the State except as authorized pursuant to waste discharge requirements, is prohibited by Section 13376 of the California Water Code. Montrose Chemical Corporation does not have valid waste discharge requirements which would authorize a discharge of pollutants.

14. This enforcement action is being taken for the protection of the environment and as such is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15121, Chapter 3, Title 14, California Administrative Code.

ORDER

1. The California Regional Water Quality Control Board, Los Angeles Region, in accordance with Section 13304 of the California Water Code does hereby order Montrose Chemical Corporation of California to cease the discharge of DDT-contaminated stormwater, clean up these DDT-contaminated soils on Montrose and adjacent property and to abate the effects thereof forthwith. The clean up shall include:

   (1) A sampling program approved by the Executive Officer to delineate the horizontal and vertical distribution of DDT in soils on Montrose and adjacent property.

   (2) Remedial action which may involve the removal of soil contaminated with DDT and disposal of it at a Class I disposal site. The results of all soil tests shall be submitted for approval, and the extent of soil to be removed shall be subject to approval by the Executive Officer of the Board. An equally effective alternate plan may be submitted for approval by the Executive Officer.

2. Within 30 days of the effective date of this Order, Montrose Chemical Corporation is hereby directed to submit in writing a Sampling Plan to conduct a comprehensive sampling program to identify the extent to which surface soils and subsurface soils, both on and off Montrose property, have been contaminated with DDT. The plan is to be implemented only after approval by the Executive Officer of the Board.

3. Within 60 days after approval of the Sampling Plan by the Executive Officer, Montrose Chemical Corporation shall submit a written report describing the data collected and findings of the sampling program.

4. The Executive Officer will review the written report showing the data and findings of the sampling program, and will transmit to Montrose the results of that review, including specific remedial measures to be implemented by Montrose.

Raymond M Hertel

RAYMOND M. HERTEL
Executive Officer

May 6, 1983
Date

CERTIFIED MAIL 0416242
RETURN RECEIPT REQUESTED

06 MAY 1983

In reply T-3-3
Refer to: ERS 6-2

Samuel Rotrosen, President
Montrose Chemical Corporation
of California
2401 Morris Avenue
P.O. Box E
Union, NJ 07083

Dear Mr. Rotrosen:

Enclosed please find an Order issued by the Environmental Protection Agency (EPA) to Montrose Chemical Corporation for its Torrance, California facility. The Order is issued on this date pursuant to Secion 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §9606(a), and Section 3013 of the Resource Conservation and Recovery Act, 42 U.S.C. §9606(a).

The Order sets forth certain activities to be undertaken at Montrose Chemical Corporation of California's facility located at 20201 South Normandie Avenue, Torrance, California to abate the release or threatened release of DDT and to assess the DDT contamination at and in the vicinity of the site.

Also enclosed you will find a copy of EPA's Inspection Report which documents the DDT contamination at the site.

Cordially yours,

Original Signed by:

SONIA F. CROW
Regional Administrator

Enclosures

cc: John Kallok, Montrose, Torrance, California
Angelo Bellomo, California Dept. of Health Services
Regional Water Quality Control Board, Los Angeles (Hertel)
State Water Quality Control Board (Detit)
Jim Steele, California Dept. of Fish and Game

bc: Severino, T-4-2
Simanonok, T-3-2
Ramirez, ORC
Covington, WMD W-1

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 9

In the Matter of MONTROSE CHEMICAL CORPORATION OF CALIFORNIA (UNION, NEW JERSEY), Respondent. Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. §9606(a)) and Section 3013 of the Resource Conservation and Recovery Act (42 U.S.C. §6934)	)	ORDER Docket No. 83-01

JURISDICTION

The following Order is issued on this date to Montrose Chemical Corporation of California, P.O. Box E, Union, New Jersey (hereinafter referred to as Respondent), pursuant to the authority vested in the President of the United States by §106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. §9606(a), delegated to the Administrator of the United States Environmental Protection Agency (EPA) by Executive Order Number 12316 (August 20, 1981, 46 FR 42237), and redelegated to the Regional Administrator, EPA Region 9. The following Order is also issued pursuant to the authority vested in the Administrator contained in §3013 of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6934, and delegated to the Regional Administrator, EPA Region 9. Notice of the issuance of this Order has heretofore been given to the State of California.

FINDINGS OF FACT

1. Respondent is the current owner and operator of a facility located at 20201 South Normandie Avenue in Torrance, California.

2. Respondent has engaged in the generation, storage, and disposal of hazardous substances/waste.

3. Respondent has manufactured, formulated, ground and distributed dichloro diphenyl trichloroethane (DDT) at its facility from 1947 to 1982. Respondent has ceased operations, and is dismantling its facility.

4. Following an extensive review of the health and environmental hazards of DDT, EPA decided in 1972 to ban its further use in the United States. This decision was based in part on several well evidenced properties such as:

   A. DDT and its metabolites DDD and DDE (hereinafter referred to as DDT) are toxicants with long-term persistence in soil and water;

   B. DDT is widely dispersed by erosion, runoff and volatilization; and

   C. DDT exhibits low water solubility and high lipophilicity which results in concentrated accumulation in the fat of wildlife and humans at concentrations which may be hazardous.

5. DDT is a hazardous substance as defined by §101(14) of CERCLA, and a hazardous waste as defined by §1004(5) of RCRA.

6. On August 5, 1980, Respondent notified EPA of its hazardous waste activity as required by RCRA. That notification indicated that Respondent generated, treated, stored and disposed of the following wastes:

EPA Hazardous Waste Number	Description
D002	Corrosive
U034	Chloral
U037	Chlorobenzene
U061	DDT

7. On November 11, 1980, Respondent submitted a RCRA Hazardous Waste Permit Application as part of a Consolidated Permits Program Application to EPA. Respondent's application estimated that it annually produced 50,000 tons of corrosive hazardous waste which was stored in tanks. Respondent further stated that, "There may be rain runoff discharges possibly subject to NPDES requirements. The extent to which such storm water discharges should be subject to permitting requirements is presently under discussion with EPA."

8. On December 22, 1980, EPA conducted a RCRA Interim Status Standards Investigation. During this investigation a spokesman for Respondent stated, "that a series of underground collection tanks, each with 20,000 gallon capacity, are emptied every day by pumping into 50,000 gallon storage tanks. All runoff is gathered in an open concrete pit and recycled."

9. The California State Mussel Watch (SMW) Marine Monitoring Program, in cooperation with the California State Water Resources Control Board, monitors the accumulation of trace

metals and synthetic organic toxicants in marine mussels. The SMW Program Report for 1980-1981 shows elevated levels of DDT within the Los Angeles-Long Beach Harbor area. Late 1981 SMW data indicated that the highest levels of DDT in mussels within Los Angeles Harbor were found at the Dominguez Channel station (top of Consolidated Slip in Los Angeles Harbor). These data suggest that Dominguez Channel may be a significant source of DDT, as observed in the indicator organism Mytilis sp. (mussels).

10. Since 1977, the Los Angeles Flood Control District has routinely sampled at Torrance Lateral at Main Street, a tributary of Dominguez Channel, approximately 1.5 - 2 miles downstream of Respondent's facility. The analysis of water samples at this location shows elevated levels of DDT, particularly during periods of stormwater flow.

11. On November 23, 1981, California Department of Fish and Game took three soil and two water samples at Respondent's facility (both on-site and off-site). Analysis of these samples indicated DDT concentrations as high as 1410 parts per billion (ppb) in water and 8274 parts per million (ppm) in soil.

12. On November 9, 1982, EPA initiated a field investigation of Respondent's facility to determine whether hazardous substances/waste were being released to the environment in combination with stormwater runoff from the facility.

13. The investigation revealed that DDT is leaving Respondent's facility via stormwater runoff. This discharge enters a

catchbasin at Farmers Brothers Coffee Company approximately 500 feet south of Montrose. The underground storm drain system runs for approximately 3/4 mile, where it discharges into the Torrance Lateral Flood Control Channel. This channel then runs for about 2 miles to the Dominguez Channel, a tributary of Los Angeles Harbor and San Pedro Bay, and the Pacific Ocean.

14. On November 9, 1982, water samples were collected downstream of the facility. While the analysis significantly underestimates the quantity of DDT (a portion of the insoluble fraction was not measured), concentrations of 209 to 360 ppb were found in surface waters leaving the site, and 695 ppb was found in water ponded off-site.

15. On November 10, 1982, off-site soil samples were collected. Analysis of these samples has revealed that soils off-site have been contaminated by DDT to levels as high as 1975 ppm. These contaminated soils are readily accessible to the public, as the area is unfenced and residential areas are located within 500 feet.

16. On December 23, 1982, EPA notified Respondent that it had sufficient reason to believe that a release of hazardous substances may have occurred and that there continues to exist the threat of additional releases of such substances to the environment. In addition, EPA requested that Respondent provide specific information pertaining to these releases.

17. On February 4, 1983, Respondent provided information to EPA which documents the following:

A. On November 9, 1982, Respondent took three water samples downstream of the facility. Analysis of these samples by one laboratory indicated DDT concentrations as high as 3260 ppb; analysis by another laboratory showed DDT concentrations as high as 1290 ppb.

B. In January 1982, Respondent sampled stormwater runoff downstream of the facility. The total DDT concentration found was 130 ppb.

C. A January 25, 1982 environmental audit of Respondent's facility noted that the facility did not have adequate spill containment and that stormwater collected on site would be likely to drain to the city storm sewer system, [Los Angeles] harbor and the Pacific Ocean.

D. On November 23, 1981, California Department of Fish and Game took three soil and two water samples at Respondent's facility (both on-site and off-site). Duplicate samples were provided to Respondent. Respondent's analysis of these samples indicated DDT concentrations as high as 40,000 ppm in soil and 30,000 ppb in water.

E. In October 1981, Respondent took seven soil samples on the perimeter of the facility. DDT concentrations were found as high as 1940 ppm.

F. In August 1981, Respondent took 14 soil samples on-site and off-site at the facility. Two separate laboratory analyses were performed which showed DDT concentrations as high as 1883 ppm and 2500 ppm, respectively.

G. In May 1981, Respondent took 37 soil samples on-site and off-site at the facility. Two separate laboratory analyses were performed which showed DDT concentrations as high as 2830 ppm and 7600 ppm, respectively. One laboratory also reported monochlorobenzene (MCB) levels as high as 720 ppm.

H. Following a MCB spill adjacent to Respondent's facility, on February 24-26, 1981, the California Department of Health Services took seven water residue samples off-site at the facility. Analysis showed DDT concentrations as high as 98 ppm and MCB levels as high as 84 percent.

18. MCB is a hazardous substance as defined by §101(14) of CERCLA, and a hazardous waste as defined by §1004(5) of RCRA.

19. Following a determination of the full extent of contamination, EPA will assess alternative remedial measures consistent with the National Contingency Plan. Following completion of the alternatives assessment, EPA will determine the remedial measures needed to remedy the contamination from DDT and MCB releases to the environment, and which are necessary to protect public health and the environment. EPA may then issue a new or revised enforcement action to implement these remedial measure(s).

DETERMINATION

Upon the basis of the foregoing Findings of Fact, the Regional Administrator has determined that there may be an imminent and substantial endangerment to the public health or welfare or the environment due to releases and threatened releases of

hazardous substances from a facility located at 20201 South Normandie Avenue, Torrance, California, a facility within the meaning of §101(9) of CERCLA. The Regional Administrator has also determined that the presence of hazardous waste at the facility and release of hazardous waste from the same facility may present a substantial hazard to human health or the environment.

EPA has further determined that Respondent is a person responsible for conducting the actions ordered herein, which are necessary to protect the public health and welfare and the environment and to ascertain the nature and extent of the hazard.

ORDER

Based upon the foregoing Determinations and Findings of Fact, it is hereby ordered and directed that Respondent shall (I) cease the discharge of DDT-contaminated stormwater, and (II) submit and implement a Sampling Plan to determine the extent of DDT contamination. Specifically:

I. A. Respondent shall immediately take action in order to discontinue the releases of DDT isomers and metabolites (hereinafter referred to as DDT) which are contained in stormwater discharges leaving the facility. This must be accomplished by: use of containment barriers, diversion structures, and pumping and treatment facilities or equivalent methods. Respondent shall notify EPA of the actions taken to cease the discharge within 30 days of the effective date of this Order. However, Respondent shall notify EPA immediately upon selection of the method to be used to cease DDT releases.

B. Until the actions specified in Section I above are completed, Respondent shall immediately initiate an on-site and off-site monitoring program (including sampling and analysis) of stormwater discharges resulting from each storm event and report the results in writing to EPA within 10 days of the date the samples were taken.

C. Stormwater discharges shall be contained within 30 days.

II. Respondent shall carry out monitoring, testing, analysis, and reporting designed to determine the full nature and extent of the water and soil contamination resulting from the continued release of DDT from the facility. Specifically, Respondent shall:

A. Within 30 days of the effective date of this Order, prepare and submit to EPA for approval a written Proposal to conduct a comprehensive sampling and analysis program designed to support subsequent remedial actions. This Proposal shall also identify and determine the extent to which remedial actions may be necessary to abate DDT and MCB contamination of waters, surface soils and subsurface soils, both on and off of the facility. This Proposal shall also include provisions for gaining access to and obtaining samples from adjacent properties which may have been contaminated with DDT and MCB. The Proposal shall include the following:

(1) a sufficient number of sample locations in order to define the extent of the contamination and to provide the data required to enable the proposal of remedial cleanup alternatives;

(2) sampling protocols for water and soil;

(3) analytical and quality control protocols for the sampling program, including:

(a) adequate sample identification;

(b) sample preservation techniques;

(c) chain of custody;

(d) use of the analytical methods set forth in Attachments A and B, for DDT and MCB, respectively;

(e) identification of person(s) conducting the sampling and analysis;

(4) retention of, and submission to EPA upon request, splits of all samples taken pursuant to this Order; and

(5) identification and maintenance of all splits in accordance with the protocols specified (3a,3b, and 3c) above.

(6) precautions which will be taken to insure the health and welfare of the individuals associated with the field work and laboratory analyses;

(7) precautions which will be taken during sampling to insure the health and welfare of the surrounding community.

B. Upon EPA approval of the Proposal specified in II.A above, with any modifications EPA deems reasonable to ascertain the nature and extent of the hazard, immediately implement the approved Proposal.

C. Complete all work (including sample analyses) as set forth in the approved Proposal within 45 days after receipt of EPA approval of the Proposal.

D. Submit to EPA a written report describing the data collected and findings made within 60 days after receipt of EPA approval of the Proposal.

EFFECTIVE DATE -- OPPORTUNITY TO CONFER

Except as otherwise provided below, this Order is effective immediately upon the date of receipt thereof by Respondent. All times for performance of response activities shall be calculated from that date.

You may request a conference to be held within fourteen (14) calendar days after receipt of this Order, to discuss Section I of the Order; its applicability to you; the correctness of any factual determinations upon which the Order is based; the appropriateness of any action which you are ordered hereby to take; and any other relevant and material issue. If you request a conference, this Order will not become effective until the expiration of the said fourteen day period. However, you are hereby placed on notice that EPA may take any action, including the actions described in Section I of this Order, which may be necessary for the protection of public health and welfare and the environment, and you may be liable under §107(a) of CERCLA for the costs of those government actions.

You are required to submit to EPA the Proposal in Section II of the Order for accomplishing the required monitoring, testing, analysis, and reporting; in accordance with §3013 of RCRA; within 30 days from the issuance of the Order. Under provisions of Act, you are entitled to request a conference with EPA. After an opportunity to confer, you are required to conduct the approved plan.

At any conferences held pursuant to your request, you may appear in person and/or you may be represented by attorney or

other representatives for the purpose of presenting any objections, defenses or contentions which you may have regarding this Order. If you desire such conferences, please contact Harry Seraydarian, Director, Toxics and Waste Management Division, U.S. Environmental Protection Agency, Region 9, 215 Fremont Street, San Francisco, California 94105, (415)974-7640, within the time set forth above for requesting a conference.

PENALTIES FOR NON-COMPLIANCE

You are advised that willful violation or failure or refusal to comply with Section I of this Order, or any portion hereof, may subject you to a civil penalty of not more than $5,000.00 for each day in which violation occurs or such failure to comply continues in accordance with §106(b) OF CERCLA. Failure to comply with Section I of this Order, or any portion hereof, without sufficient cause, may also subject you to liability for punitive damages in the amount of three times the total of all costs incurred by the government as a result of your failure to take proper action in accordance with §107(c)(3) of CERCLA.

In addition, you are advised that EPA may in accordance with §3013(e) of RCRA, commence a civil action in a United States District Court, if you fail or refuse to comply with Section II of this Order. Such Court shall have jurisdiction to require compliance with Section II of this Order and to assess civil penalties not to exceed $5000.00 per day for each day that failure or refusal to comply occurs.

WITNESS my hand in the City of San Francisco, State of California, as Regional Administrator of the United States Environmental Protection Agency, Region 9, on this 6th day of May, 1983.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By: _____
SONIA F. CROW
Regional Administrator